Analysis of Unicorn Startups

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1 Setup

1.1 Import Packages

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from matplotlib.ticker import FuncFormatter
import seaborn as sns
import re
```

1.2 Global Settings

```
sns.set_theme(palette='husl', rc={"figure.dpi": 200})
pd.set_option('display.max_columns', 50, 'display.width', 200)
```

2 Data Processing

2.1 Load Data

```
df = pd.read_csv('input/datasets/Unicorns_Completed (2024).csv')
df_wiki = pd.read_csv('input/raw_data/list-of-unicorn-startups_20250619 (wikipedia).csv')
```

2.2 Data Cleaning

```
def clean_years_to_unicorn_labels(s):
    m = re.match(r'(\d+)y?\s?(\d+)m?o?', s)
    return f'{m[1]}y{m[2]}m' if m else s
df['Years to Unicorn'] = df['Years to Unicorn'].apply(clean_years_to_unicorn_labels)

def correct_industry_labels(s):
    if s == 'Health':
        return 'Healthcare & Life Sciences'
    if s == 'West Palm Beach':
        return 'Enterprise Tech'
    return s
df['Industry'] = df['Industry'].apply(correct_industry_labels)

def correct_company_names(s):
    if s == 'Scale':
        return 'Scale AI'
    return s
df['Company'] = df['Company'].apply(correct_company_names)

# Remove duplicates
df = df[~df.duplicated(['Company'])]
```

2.3 Data Preparation

2.3.1 Column Types

```
df['Unicorn Date'] = pd.to_datetime(df['Unicorn Date'])
df['Valuation ($B)'] = pd.to_numeric(df['Valuation ($B)'])
df['Valuation ($)'] = df['Valuation ($B)'] * 1e9
df['Unicorn Year'] = df['Unicorn Date'].dt.year
df['Funding ($B)'] = df['Total Equity Funding ($)'] / 1e9
df['Funding ($M)'] = df['Total Equity Funding ($)'] / 1e6
```

```
df['Investors'] = df['Select Investors'].str.split(', ')
```

2.3.2 Time to Unicorn

```
def convert_years_to_months(years_str):
    if 'y' in years_str and 'm' in years_str:
        years, months = years_str.split('y')
        months = months.replace('m', '').strip()
        return int(years.strip()) * 12 + int(months)
    elif 'y' in years_str:
        years = years_str.replace('y', '').strip()
        return int(years) * 12
    elif 'm' in years_str:
        months = years_str.replace('mo', '').replace('m', '').strip()
        return int(months)
    else:
        return None
df['Months to Unicorn'] = df['Years to Unicorn'].apply(convert_years_to_months)
df['Years to Unicorn'] = df['Months to Unicorn'] / 12
```

2.3.3 Merge datasets

- Scraped data from Wikepedia (Latest Valuations, Sectors and Founders)

```
df_wiki.rename(columns={'Valuation (US$ billions)': 'Latest Valuation ($B)',
                        'Industry': 'Sector'},
               inplace=True)
df_wiki = df_wiki.drop_duplicates('Company')
df_wiki['Company'] = df_wiki['Company'].str.strip()
df_wiki['Founder(s)'] = df_wiki['Founder(s)'].str.replace(' and ', ', ').str.split(',
↪  ')
def list_of_sectors(s):
    sectors = s.replace(' and ', ', ').split(', ')
    return list(map(lambda x: x.strip().title(), sectors))
df_wiki['Sector'] = df_wiki['Sector'].dropna().apply(list_of_sectors)
df_wiki = df_wiki.assign(tmp_col=lambda x: x.Company.str.lower()) # Create a tmp col
↪  for Company matching
df = df.assign(tmp_col=lambda x: x.Company.str.lower())\
       .merge(df_wiki[['tmp_col', 'Latest Valuation ($B)', 'Sector', 'Founder(s)']],
       ↪  on='tmp_col', how='left')\
       .drop(['tmp_col'], axis=1)
df['Latest Valuation ($B)'] = pd.to_numeric(df['Latest Valuation
↪  ($B)'].fillna(value=df['Valuation ($B)']))
# Determine unicorn type based on latest valuations
df['Unicorn Type'] = pd.cut(df['Latest Valuation ($B)'],
                            labels=['Unicorn', 'Decacorn', 'Centicorn'],
                            bins=[0, 10, 100, df['Latest Valuation ($B)'].max()])
```

2.4 Preview

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1240 entries, 0 to 1239
Data columns (total 20 columns):
 #   Column                   Non-Null Count  Dtype
---  ------                   --------------  -----
 0   Company                  1240 non-null   object
 1   Valuation ($B)           1240 non-null   float64
 2   Total Equity Funding ($) 1240 non-null   int64
 3   Unicorn Date             1240 non-null   datetime64[ns]
 4   Date Founded             1240 non-null   int64
 5   Years to Unicorn         1240 non-null   float64
 6   Industry                 1240 non-null   object
 7   Country                  1240 non-null   object
 8   City                     1240 non-null   object
 9   Select Investors         1240 non-null   object
 10  Valuation ($)            1240 non-null   float64
 11  Unicorn Year             1240 non-null   int32
 12  Funding ($B)             1240 non-null   float64
 13  Funding ($M)             1240 non-null   float64
 14  Investors                1240 non-null   object
 15  Months to Unicorn        1240 non-null   int64
 16  Latest Valuation ($B)    1240 non-null   float64
 17  Sector                   427 non-null    object
 18  Founder(s)               137 non-null    object
 19  Unicorn Type             1240 non-null   category
dtypes: category(1), datetime64[ns](1), float64(6), int32(1), int64(3), object(8)
memory usage: 180.7+ KB
```

3 Exploratory Data Analysis

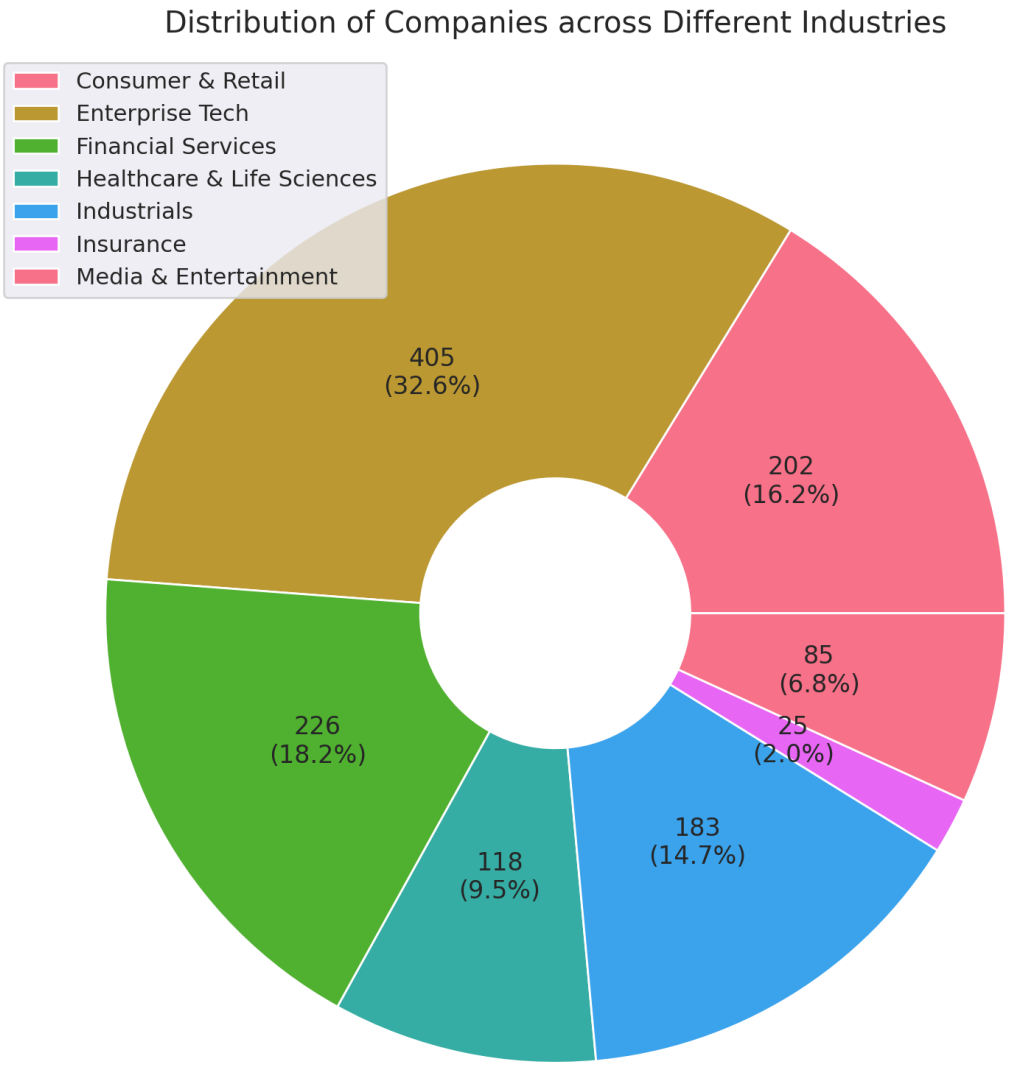
3.1 Industry-Based Analysis

3.1.1 Distribution of Companies across Different Industries

```
_df = df.groupby('Industry').size()
_df
```

```
Industry
Consumer & Retail              202
Enterprise Tech                405
Financial Services             226
Healthcare & Life Sciences     118
Industrials                    183
Insurance                       25
Media & Entertainment           85
dtype: int64
```

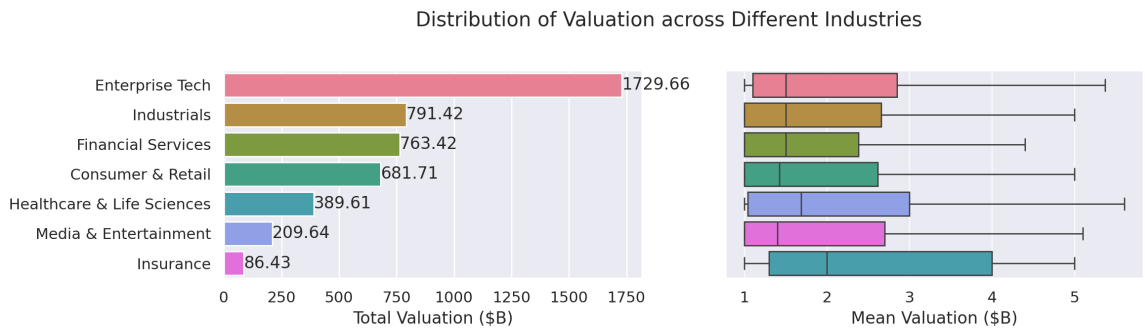
```
fig, ax = plt.subplots(figsize=(12,8), constrained_layout=True)
total = _df.sum()
_df.plot.pie(legend=True, labels=None,
             autopct=lambda pct:f"{round(total*pct/100)}\n({pct:.1f}%)",
             wedgeprops=dict(width=0.7, edgecolor='w'))
plt.suptitle('Distribution of Companies across Different Industries')
plt.show()
```



3.1.2 Distribution of Valuation across Different Industries

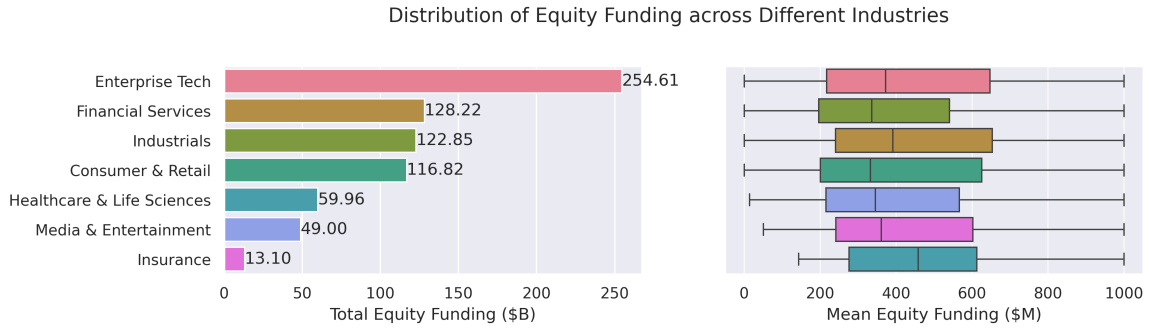
```
_df = df.groupby('Industry')['Latest Valuation ($B)'].sum().sort_values(ascending=False)

fig = plt.figure(figsize=(12, 6))
gs = fig.add_gridspec(nrows=2, ncols=2)

ax1 = fig.add_subplot(gs[0, 0])
ax2 = fig.add_subplot(gs[0, 1])
ax1.sharey(ax2)
# ax3 = fig.add_subplot(gs[1, :])

g = sns.barplot(y=_df.index, x=_df.values, hue=_df.index, ax=ax1)
for i in ax1.containers:
    ax1.bar_label(i, fmt='%.2f')
ax1.set_xlabel('Total Valuation ($B)')
ax1.set_ylabel(None)
```

```
sns.boxplot(df, y='Industry', x='Latest Valuation ($B)', hue='Industry', showfliers=False,
↪  ax=ax2)
ax2.get_yaxis().set_visible(False)
ax2.set_xlabel('Mean Valuation ($B)')

plt.grid(axis='x', alpha=0.75)
plt.suptitle('Distribution of Valuation across Different Industries')

plt.ylabel(None)
plt.show()
```



3.1.3 Distribution of Equity Funding across Different Industries

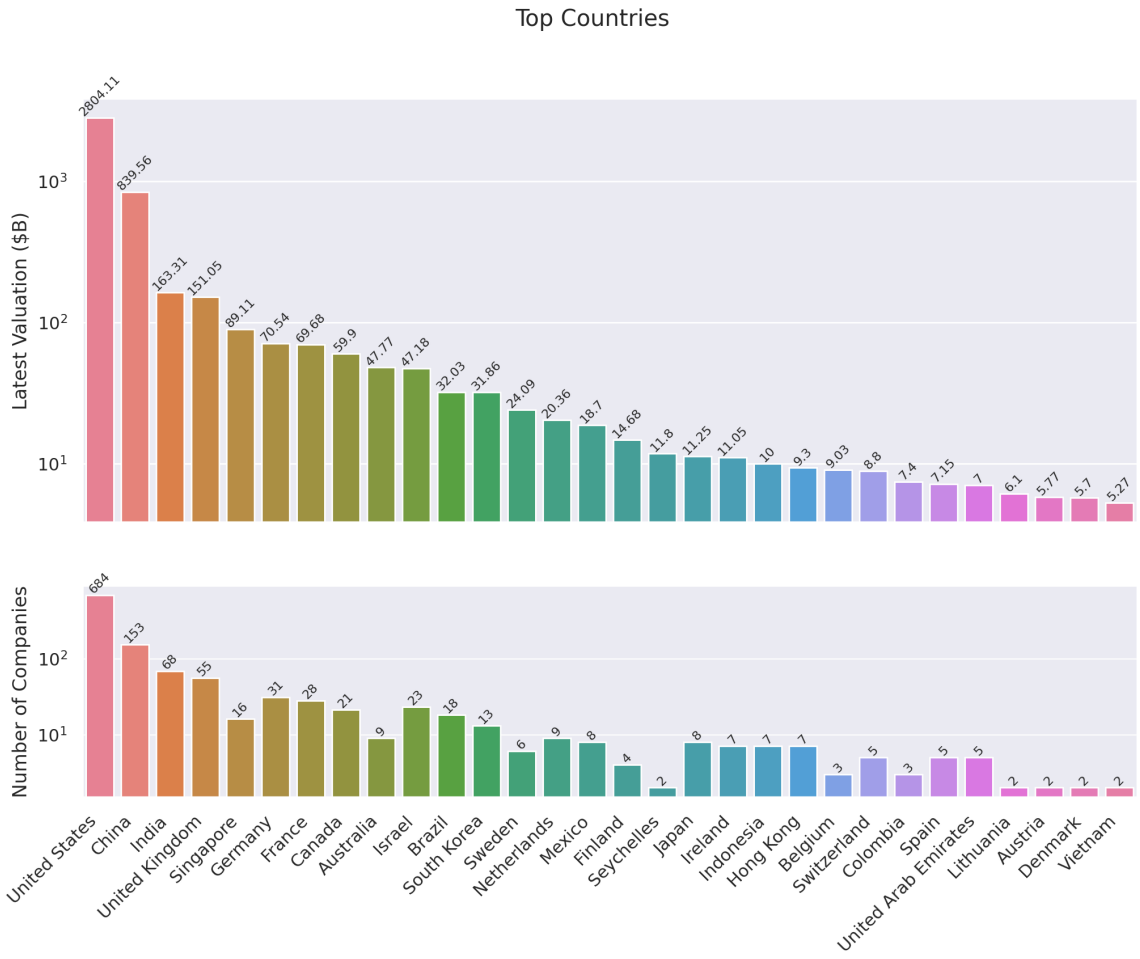
```
_df = df.groupby('Industry')['Funding ($B)'].sum().sort_values(ascending=False)

fig = plt.figure(figsize=(12, 6))
gs = fig.add_gridspec(nrows=2, ncols=2)

ax1 = fig.add_subplot(gs[0, 0])
ax2 = fig.add_subplot(gs[0, 1])
ax1.sharey(ax2)

g = sns.barplot(y=_df.index, x=_df.values, hue=_df.index, ax=ax1)
for i in ax1.containers:
    ax1.bar_label(i, fmt='%.2f')
ax1.set_xlabel('Total Equity Funding ($B)')
ax1.set_ylabel(None)
sns.boxplot(df, y='Industry', x='Funding ($M)', hue='Industry', showfliers=False, ax=ax2)
ax2.get_yaxis().set_visible(False)
ax2.set_xlabel('Mean Equity Funding ($M)')

plt.grid(axis='x', alpha=0.75)
plt.suptitle('Distribution of Equity Funding across Different Industries')

plt.ylabel(None)
plt.show()
```



3.2 Geographical Analysis

3.2.1 Top Countries by Valuation

```
_df = df.groupby('Country')['Latest Valuation ($B)']\
        .agg(['count', 'sum'])\
        .sort_values(by='sum', ascending=False)\
        .head(30)
fig, ax = plt.subplots(2, 1, figsize=(12, 8), sharex=True, gridspec_kw={'height_ratios':
↪  [2, 1]})
g = sns.barplot(_df, x=_df.index, y='sum', hue=_df.index, ax=ax[0])
g.set(ylabel='Latest Valuation ($B)',
      yscale='log')
for i in ax[0].containers:
    ax[0].bar_label(i, rotation=45, fontsize=8)
g = sns.barplot(_df, x=_df.index, y='count', hue=_df.index, ax=ax[1])
g.set(ylabel='Number of Companies',
      yscale='log')
for i in ax[1].containers:
    ax[1].bar_label(i, rotation=45, fontsize=8)
plt.suptitle('Top Countries')
plt.grid(axis='y', alpha=0.75)
plt.xticks(rotation=45, ha='right')
plt.xlabel(None)
plt.show()
```

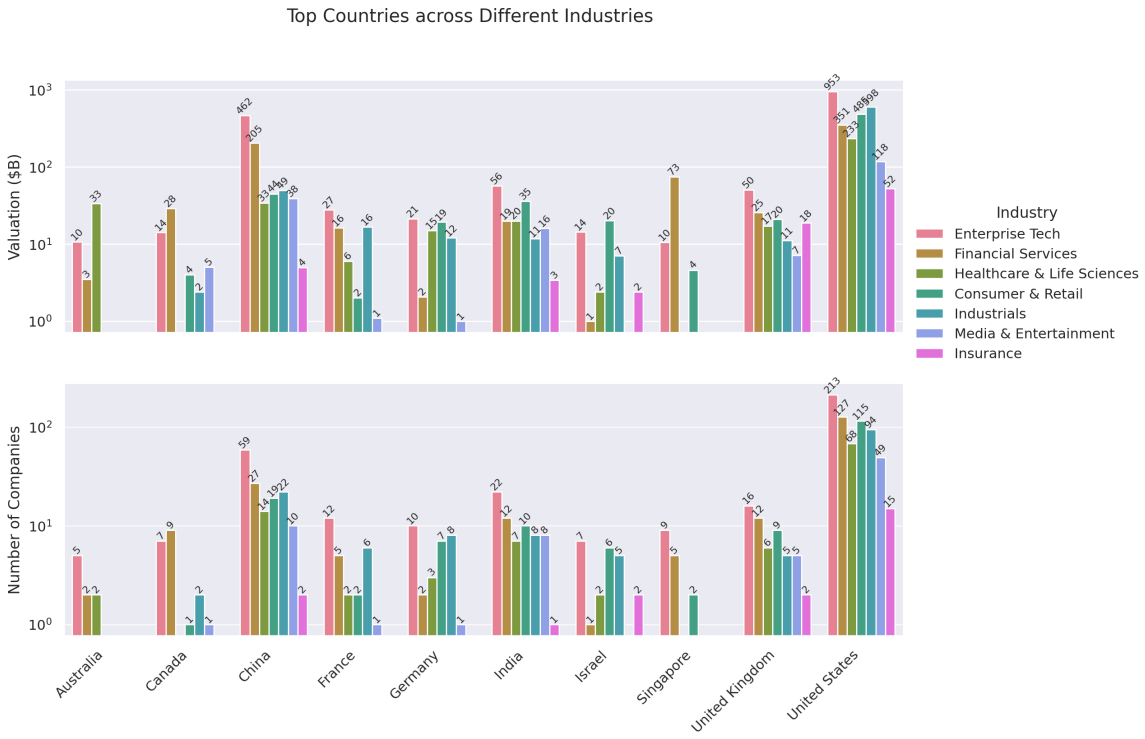


3.2.2 Top Countries across Different Industries

```
df_filtered =  df[df['Country'].isin(top_countries.head(10).index)]\
    .groupby(['Country', 'Industry'])['Latest Valuation ($B)']\
    .agg(['count', 'sum'])\
    .reset_index()
```

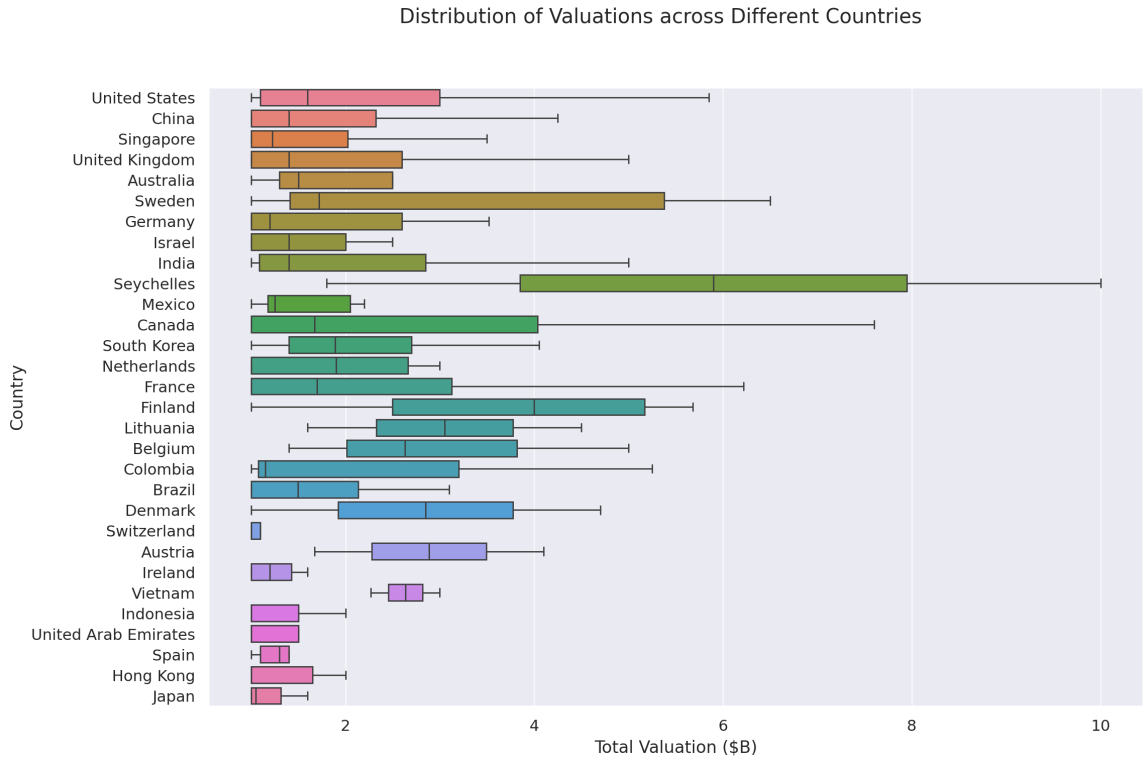
```
fig, ax = plt.subplots(2, 1, figsize=(12, 8), sharex=True)
g = sns.barplot(df_filtered, x='Country', y='sum', hue='Industry', ax=ax[0])
sns.move_legend(ax[0], 'upper left', bbox_to_anchor=(1, .55), frameon=False)
g.set(ylabel='Valuation ($B)',
      yscale='log')
for i in ax[0].containers:
    ax[0].bar_label(i, rotation=45, fontsize=8, fmt='%d')
g = sns.barplot(df_filtered, x='Country', y='count', hue='Industry', ax=ax[1],
↪  legend=False)
g.set(ylabel='Number of Companies',
      yscale='log')
for i in ax[1].containers:
    ax[1].bar_label(i, rotation=45, fontsize=8)
plt.suptitle('Top Countries across Different Industries')
plt.grid(axis='y', alpha=0.75)
```

```
plt.xticks(rotation=45, ha='right')
plt.xlabel(None)
plt.show()
```

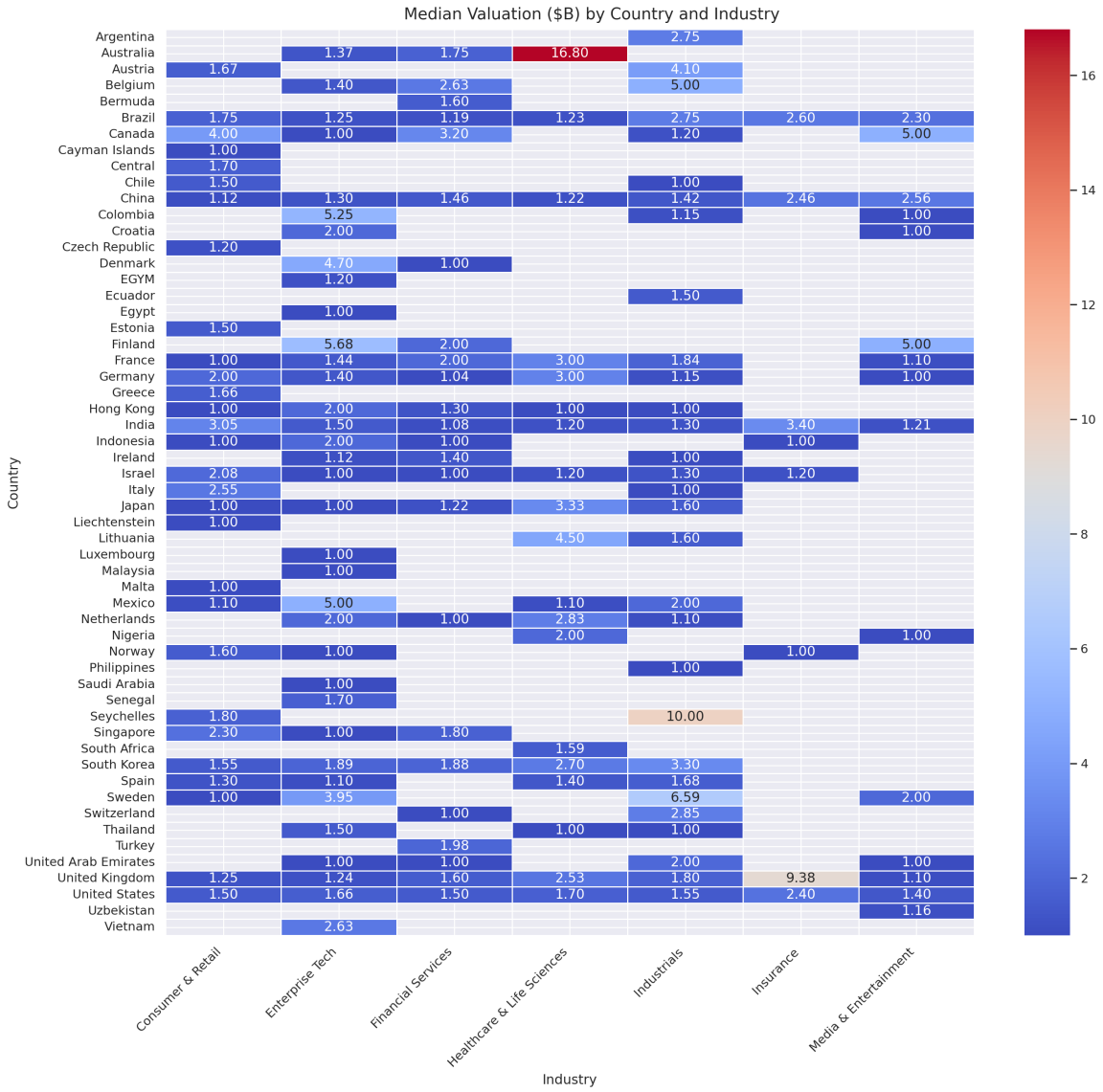


3.2.3 Mean Distribution of Valuations across Different Countries

```
fig, ax = plt.subplots(figsize=(12, 8))
sns.boxplot(df[df['Country'].isin(top_countries.index)],
            y='Country',
            x='Latest Valuation ($B)',
            hue='Country',
            showfliers=False)
plt.suptitle('Distribution of Valuations across Different Countries')
ax.set(xlabel='Total Valuation ($B)',
       ylabel='Country')
plt.grid(axis='x', alpha=0.7)
plt.show()
```

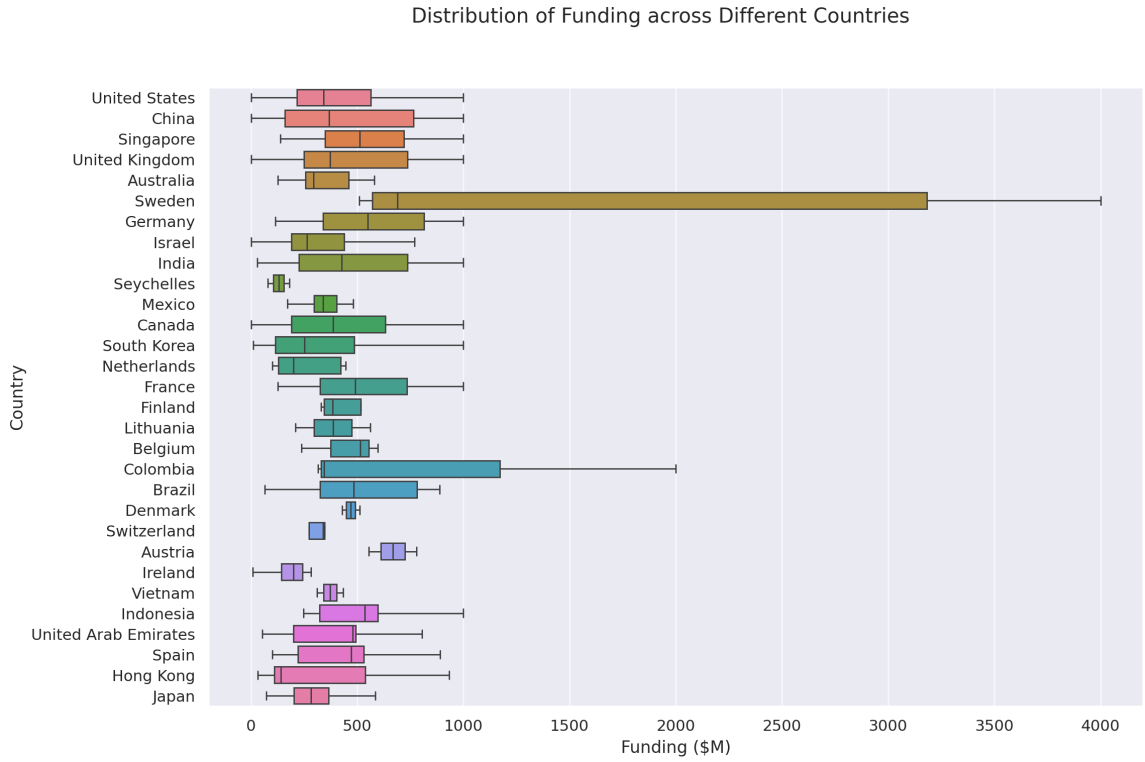



```
_df = df.pivot_table(index='Country', columns='Industry', values='Latest Valuation ($B)',
↪  aggfunc='median')
plt.figure(figsize=(15, 14))
sns.heatmap(_df, cmap='coolwarm', annot=True, fmt=".2f", linewidths=0.5)
plt.xticks(rotation=45, ha='right')
plt.suptitle('Median Valuation ($B) by Country and Industry')
plt.tight_layout()
plt.show()
```

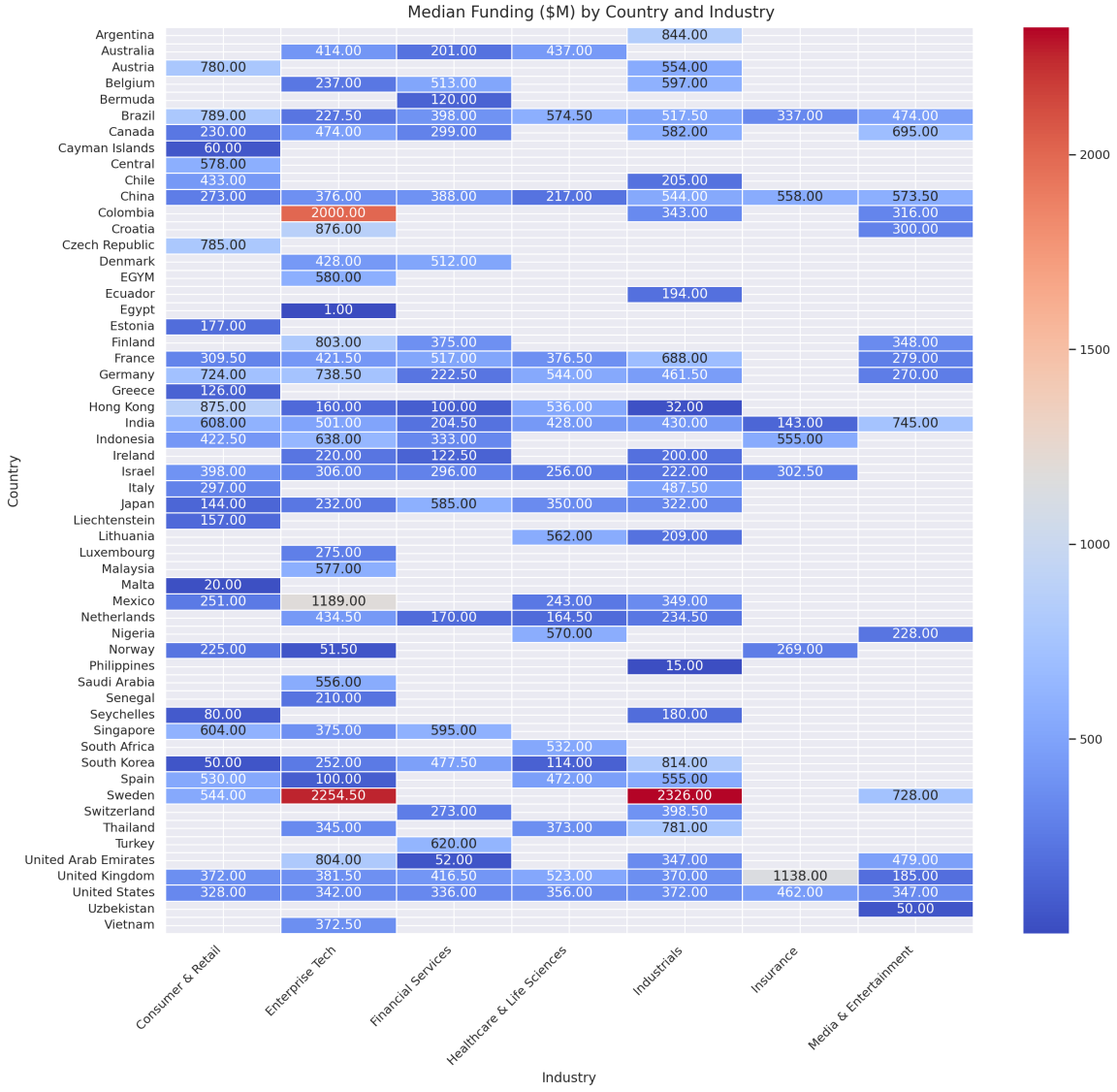


3.2.4 Mean Distribution of Equity Funding across Different Countries

```
fig, ax = plt.subplots(figsize=(12,8))
sns.boxplot(df[df['Country'].isin(top_countries.index)], y='Country', x='Funding ($M)',
↪  hue='Country', showfliers=False)
plt.suptitle('Distribution of Funding across Different Countries')
ax.set(xlabel='Funding ($M)',
       ylabel='Country')
plt.grid(axis='x', alpha=0.7)
plt.show()
```




```
_df = df.pivot_table(index='Country', columns='Industry', values='Funding ($M)',
↪  aggfunc='median')
plt.figure(figsize=(15, 14))
sns.heatmap(_df, cmap='coolwarm', annot=True, fmt=".2f", linewidths=0.5)
plt.xticks(rotation=45, ha='right')
plt.suptitle('Median Funding ($M) by Country and Industry')
plt.tight_layout()
plt.show()
```



3.3 Sector-Based Analysis

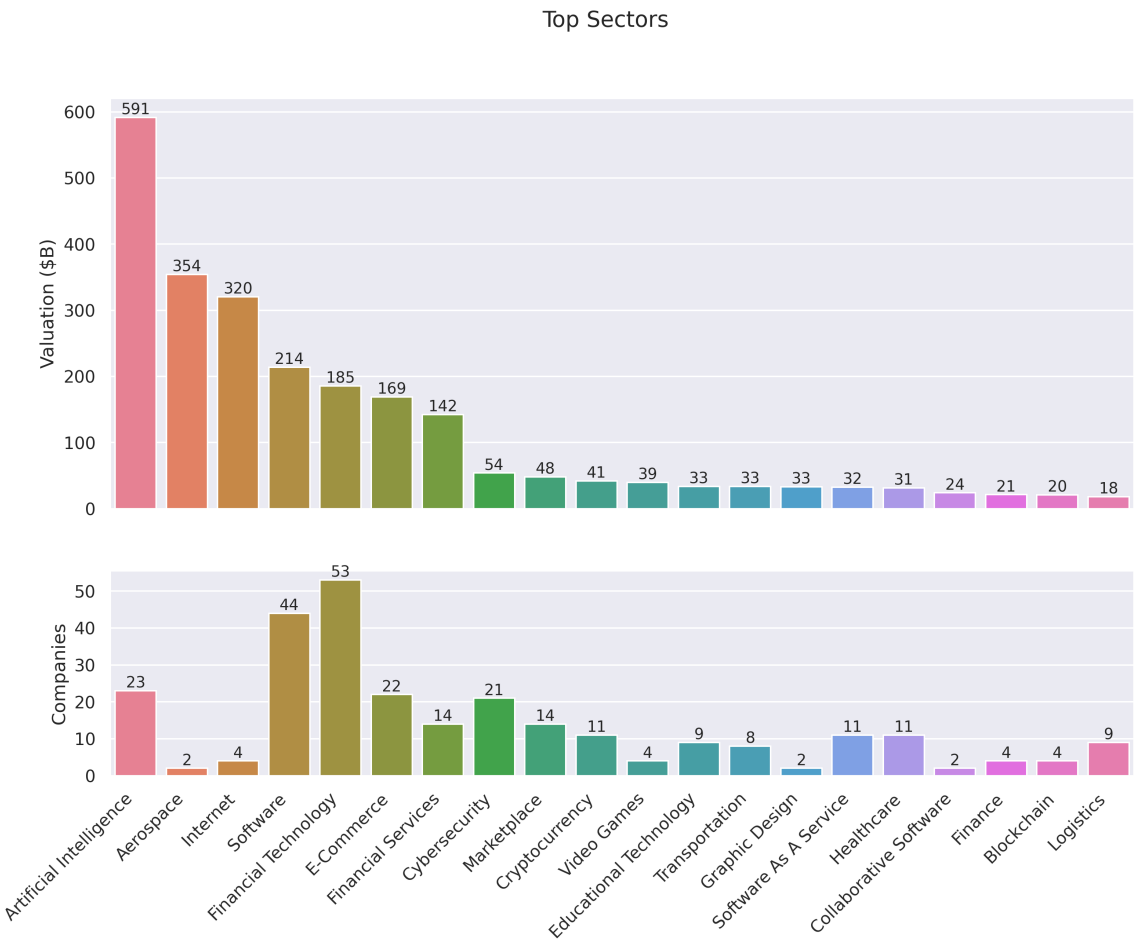
3.3.1 Top Sectors

```
_df = df.explode('Sector')[['Sector', 'Latest Valuation ($B)', 'Funding ($B)']]\
        .groupby('Sector')[['Latest Valuation ($B)', 'Funding ($B)']]\
        .agg({'Latest Valuation ($B)': ['sum', 'count'], 'Funding ($B)': 'sum'})
_df.columns = ['Valuation ($B)', 'Number of Companies', 'Funding ($B)']
_df = _df.sort_values(by='Valuation ($B)', ascending=False).head(20)
print(_df)
```

Sector	Valuation ($B)	Number of Companies	Funding ($B)
Artificial Intelligence	591.48	23	49.843
Aerospace	354.20	2	10.000
Internet	320.00	4	9.373

Software	214.06	44	35.165
Financial Technology	185.27	53	34.698
E-Commerce	169.11	22	23.460
Financial Services	142.55	14	21.798
Cybersecurity	54.08	21	12.301
Marketplace	48.03	14	13.480
Cryptocurrency	41.90	11	4.204
Video Games	39.70	4	9.375
Educational Technology	33.47	9	9.586
Transportation	33.45	8	12.480
Graphic Design	33.00	2	0.775
Software As A Service	32.70	11	4.542
Healthcare	31.30	11	6.196
Collaborative Software	24.00	2	1.400
Finance	21.30	4	2.359
Blockchain	20.80	4	2.060
Logistics	18.02	9	6.418

```
fig, ax = plt.subplots(2, 1, figsize=(12, 8), dpi=DPI, sharex=True,
↪  gridspec_kw={'height_ratios': [2, 1]})
g = sns.barplot(_df, x=_df.index, y='Valuation ($B)', ax=ax[0], hue=_df.index)
for i in ax[0].containers:
    g.bar_label(i, fmt='%d', fontsize=10)
# g = sns.barplot(_df, x=_df.index, y='Funding ($B)', ax=ax[1], hue=_df.index)
# for i in ax[1].containers:
#     g.bar_label(i, fmt='%.1f', fontsize=10)
g = sns.barplot(_df, x=_df.index, y='Number of Companies', ax=ax[1], hue=_df.index)
ax[1].set(ylabel='Companies')
for i in ax[1].containers:
    g.bar_label(i, fmt='%d', fontsize=10)
plt.xticks(rotation=45, ha='right')
plt.xlabel(None)
plt.suptitle('Top Sectors')
plt.show()
```



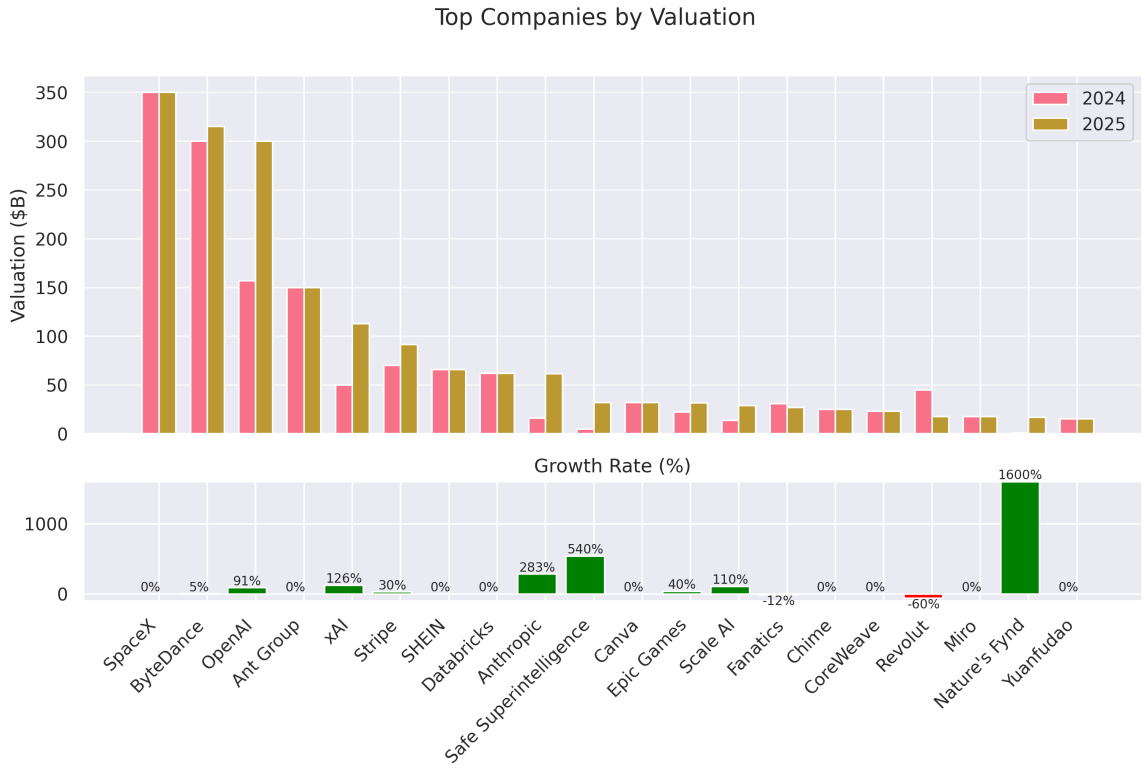
3.4 Company-Based Analysis

3.4.1 Top Companies by Valuation

```
top_companies = df.sort_values(by='Latest Valuation ($B)', ascending=False).head(20)
top_companies['Growth Rate'] = (top_companies['Latest Valuation ($B)'] -
↪  top_companies['Valuation ($B)']) / top_companies['Valuation ($B)'] * 100
```

```
# Set the positions and width for the bars
N = len(top_companies)
ind = np.arange(N)  # the x locations for the groups
width = 0.35  # the width of the bars

# Create the bars for valuation and funding
fig, ax = plt.subplots(2, 1, figsize=(12, 6), dpi=DPI, gridspec_kw={'height_ratios': [3,
↪  1]}, sharex=True)
ax[0].bar(ind, top_companies['Valuation ($B)'], width, label='2024')
ax[0].bar(ind + width, top_companies['Latest Valuation ($B)'], width, label='2025')

ax[0].set(ylabel='Valuation ($B)')
ax[0].legend()
ax[0].grid(axis='y', alpha=0.75)
```

```
ax[1].bar(ind, top_companies['Growth Rate'], color=np.where(top_companies['Growth
↪  Rate']>0,'g','r'))
ax[1].set(title='Growth Rate (%)')
for i in ax[1].containers:
    ax[1].bar_label(i, fmt='%d%%', fontsize=8)
ax[1].set(ylim=(-100,1600))
plt.xticks(ind+width/2, top_companies['Company'], rotation=45, ha='right')
plt.suptitle('Top Companies by Valuation')
plt.show()
```



Top Companies accross Different Industries

```
_df = df.groupby('Industry')[['Company', 'Latest Valuation ($B)']].apply(lambda grp:
↪  grp.nlargest(3, 'Latest Valuation ($B)'))[['Company', 'Latest Valuation ($B)']]
_df.index = _df.index.droplevel(1)
_df = _df.groupby(level=0).apply(lambda x: ',
↪  '.join(x['Company'])).reset_index(name='Companies')
_df
```

	Industry	Companies
0	Consumer & Retail	xAI, Stripe, Safe Superintelligence
1	Enterprise Tech	SpaceX, ByteDance, Anthropic
2	Financial Services	Ant Group, SHEIN, Epic Games
3	Healthcare & Life Sciences	Canva, CoreWeave, Miro
4	Industrials	OpenAI, Databricks, Discord
5	Insurance	Revolut, Gusto, Ramp
6	Media & Entertainment	Nature's Fynd, Xingsheng Selected, Talkdesk

Top Companies accross Different Countries

```
_df = df[df['Country'].isin(top_countries.index)]\
    .groupby('Country')[['Company', 'Latest Valuation ($B)']]\
    .apply(lambda grp: grp.nlargest(3, 'Latest Valuation ($B)'))[['Company', 'Latest
    ↪  Valuation ($B)']]
_df.index = _df.index.droplevel(1)
_df = _df.groupby(level=0)\
        .apply(lambda x: ', '.join(x['Company']))\
        .reset_index(name='Companies')
_df
```

	Country	Companies
0	Australia	Canva, Airwallex, Immutable
1	Austria	BitPanda, GoStudent
2	Belgium	Collibra, Odoo, Deliverect
3	Brazil	QuintoAndar, Nuvemshop, Wildlife Studios
4	Canada	Dapper Labs, 1Password, Cohere
5	China	ByteDance, Ant Group, Yuanfudao
6	Colombia	Rappi, LifeMiles, Habi
7	Denmark	Pleo, Lunar
8	Finland	RELEX, Oura, Aiven
9	France	Doctolib, Mistral AI, Back Market
10	Germany	Celonis, Personio, Helsing
11	Hong Kong	Babel Finance, Trendy Group International, HashKeyHashKey
12	India	BYJU's, OYO Rooms, Dream11
13	Indonesia	Traveloka, Akulaku, eFishery
14	Ireland	BrowserStack, Wayflyer, Flipdish
15	Israel	StarkWare, Wiz, Moon Active
16	Japan	Preferred Networks, SmartHR, Spiber
17	Lithuania	Vinted, Nord Security
18	Mexico	Kavak, Bitso, Clip
19	Netherlands	Mollie, MessageBird, BackBase
20	Seychelles	KuCoin, Scroll
21	Singapore	SHEIN, HyalRoute, Coda Payments
22	South Korea	Toss, Yello Mobile, Kurly
23	Spain	Jobandtalent, Cabify, TravelPerk
24	Sweden	Northvolt, Klarna, Kry
25	Switzerland	SonarSource, Nexthink, MindMaze
26	United Arab Emirates	Vista Global, Tabby, Kitopi
27	United Kingdom	Revolut, Global Switch, Checkout.com
28	United States	SpaceX, OpenAI, xAI
29	Vietnam	Sky Mavis, MoMo

Top Companies accross Different Sectors

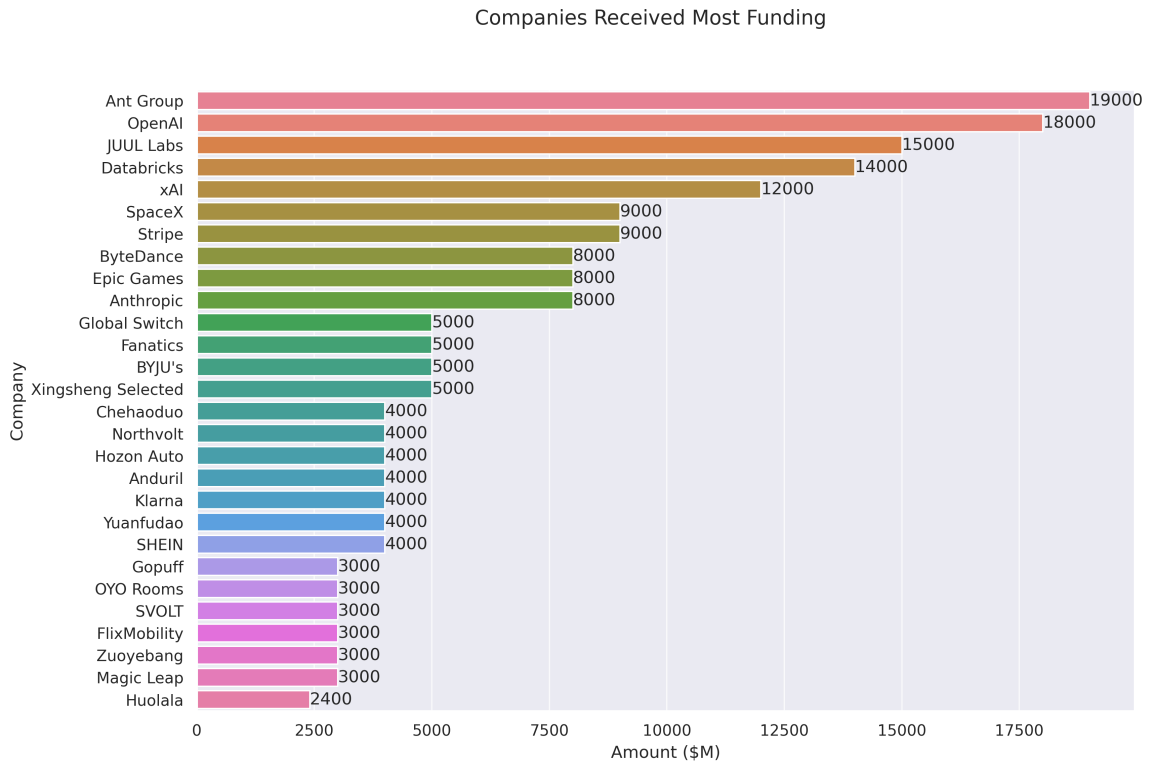
```
top_sectors = df.explode('Sector')\
        .groupby('Sector')['Latest Valuation ($B)']\
        .sum()\
        .sort_values(ascending=False)\
        .head(30)

_df = df.explode('Sector')
_df = _df[_df['Sector'].isin(top_sectors.index)]\
    .groupby('Sector')[['Company', 'Latest Valuation ($B)']]\
    .apply(lambda grp: grp.nlargest(3, 'Latest Valuation ($B)'))[['Company', 'Latest
    ↪  Valuation ($B)']]
_df.index = _df.index.droplevel(1)
_df = _df.groupby(level=0)\
         .apply(lambda x: ', '.join(x['Company']))\
         .reset_index(name='Companies')
_df
```

	Sector	Companies
0	Aerospace	SpaceX, Relativity Space
1	Artificial Intelligence	OpenAI, xAI, Anthropic
2	Batteries	Northvolt
3	Blockchain	Alchemy, Chainalysis, ConsenSys
4	Collaborative Software	Grammarly, Airtable
5	Consumer Packaged Goods	Nature’s Fynd
6	Cryptocurrency	Ripple, KuCoin, Blockchain.com
7	Cybersecurity	Tanium, Wiz, OneTrust
8	E-Commerce	SHEIN, Fanatics, Gopuff
9	Educational Technology	Yuanfudao, Articulate, Unacademy
10	Fantasy Sports	Dream11, Sorare
11	Finance	Brex, Qonto, TradingView
12	Financial Services	Stripe, Chime, Airwallex
13	Financial Technology	Revolut, Plaid, GoodLeap
14	Graphic Design	Canva, PicsArt
15	Health Technology	Ro, Commure, Alan
16	Healthcare	Devoted Health, Noom, Hinge Health
17	Internet	ByteDance, Automattic, InMobi
18	Logistics	Flexport, Zipline, Cart.com
19	Marketplace	Chehaoduo, Kavak, Back Market
20	Retail	HEYTEA, Lenskart, Away
21	Robotics	Nuro, CMR Surgical, Exotec
22	Self-Driving Cars	ZongMu Technology
23	Software	Databricks, Miro, Discord
24	Software As A Service	Talkdesk, ContentSquare, Postman
25	Software Development	OutSystems, Unqork, Lightricks
26	Technology	MEGVII, MURAL, Workato
27	Transportation	Bolt, Bolt, Rappi
28	Video Games	Epic Games, Niantic, Sky Mavis
29	Workforce Management	Rippling, Papaya Global, Workrise

3.4.2 Most-Funded Companies

```
df_filtered = df[df['Funding ($M)']>2000].sort_values(by='Funding ($M)',
↪  ascending=False).head(30)
```

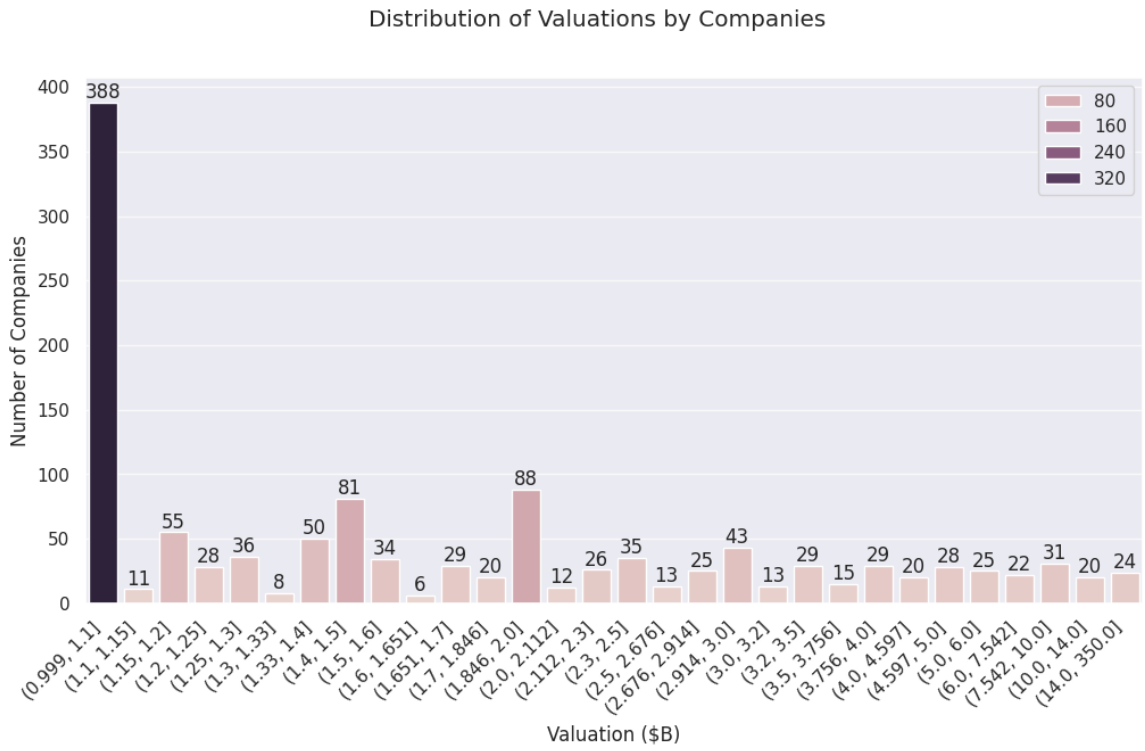
```
plt.subplots(figsize=(12, 8), dpi=300)
ax = sns.barplot(df_filtered, y='Company', x='Funding ($M)', hue='Company')
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Companies Received Most Funding')
plt.xlabel('Amount ($M)')
plt.grid(axis='x', alpha=0.75)
plt.show()
```



3.4.3 Distribution of Valuation by Companies

```
# Define the bins for valuation ranges
# bins = [0, 1, 1.5, 2, 3, 4, 5, 6, 8, 10, 20, 30, 50, 100, 200, 300, 400]
# labels =  [f'{a}-{b}' for a, b in zip(bins[:-1], bins[1:])]
# cuts = pd.cut(df['Valuation ($B)'], bins=bins, labels=labels)

cuts = pd.qcut(df['Latest Valuation ($B)'], 50, duplicates='drop')

# Count the number of companies in each bin
distribution = cuts.value_counts().sort_index()

# Plot the Bar Chart
```

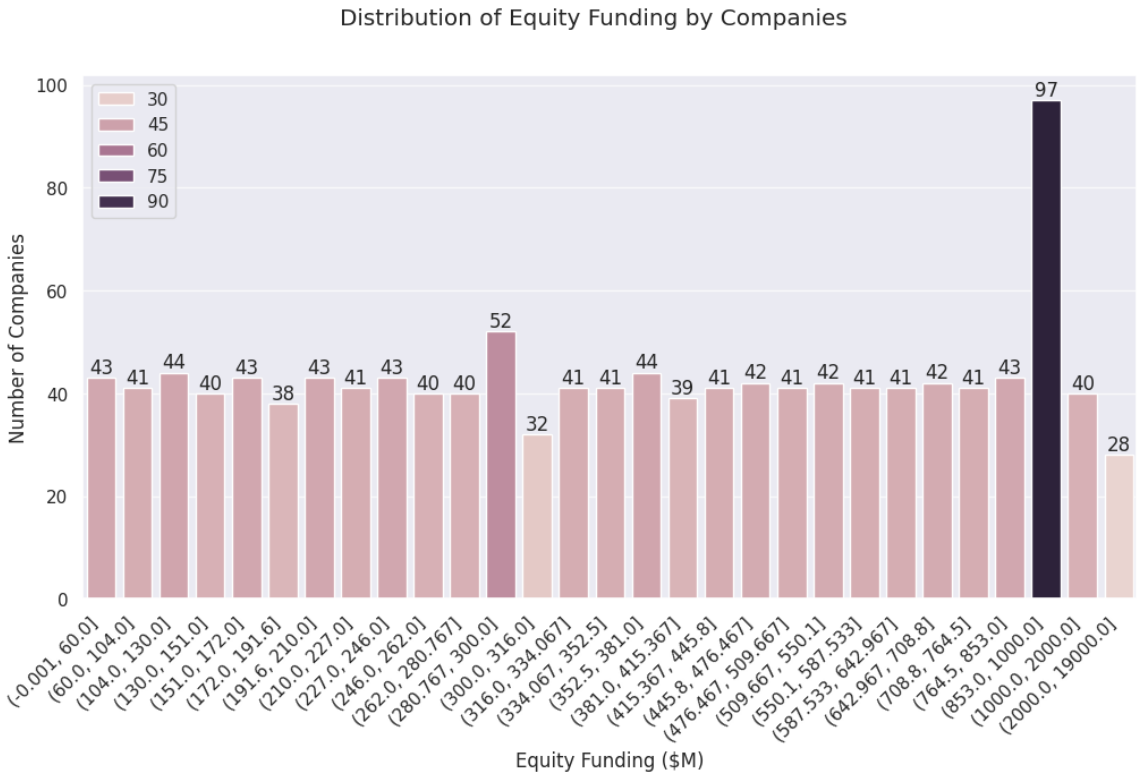
```
plt.figure(figsize=(12, 6))
ax = sns.barplot(x=distribution.index,
                 y=distribution.values, hue=distribution.values)
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Distribution of Valuations by Companies')
plt.xlabel('Valuation ($B)')
plt.ylabel('Number of Companies')
plt.xticks(rotation=45, ha='right')
plt.grid(axis='y', alpha=0.75)
plt.show()
```



3.4.4 Distribution of Equity Funding by Companies

```
cuts = pd.qcut(df['Funding ($M)'], 30, duplicates='drop')

# Count the number of companies in each bin
distribution = cuts.value_counts().sort_index()

# Plot the Bar Chart
plt.figure(figsize=(12, 6))
ax = sns.barplot(x=distribution.index,
                 y=distribution.values, hue=distribution.values)
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Distribution of Equity Funding by Companies')
plt.xlabel('Equity Funding ($M)')
plt.ylabel('Number of Companies')
plt.xticks(rotation=45, ha='right')
```

```
plt.grid(axis='y', alpha=0.75)
plt.show()
```



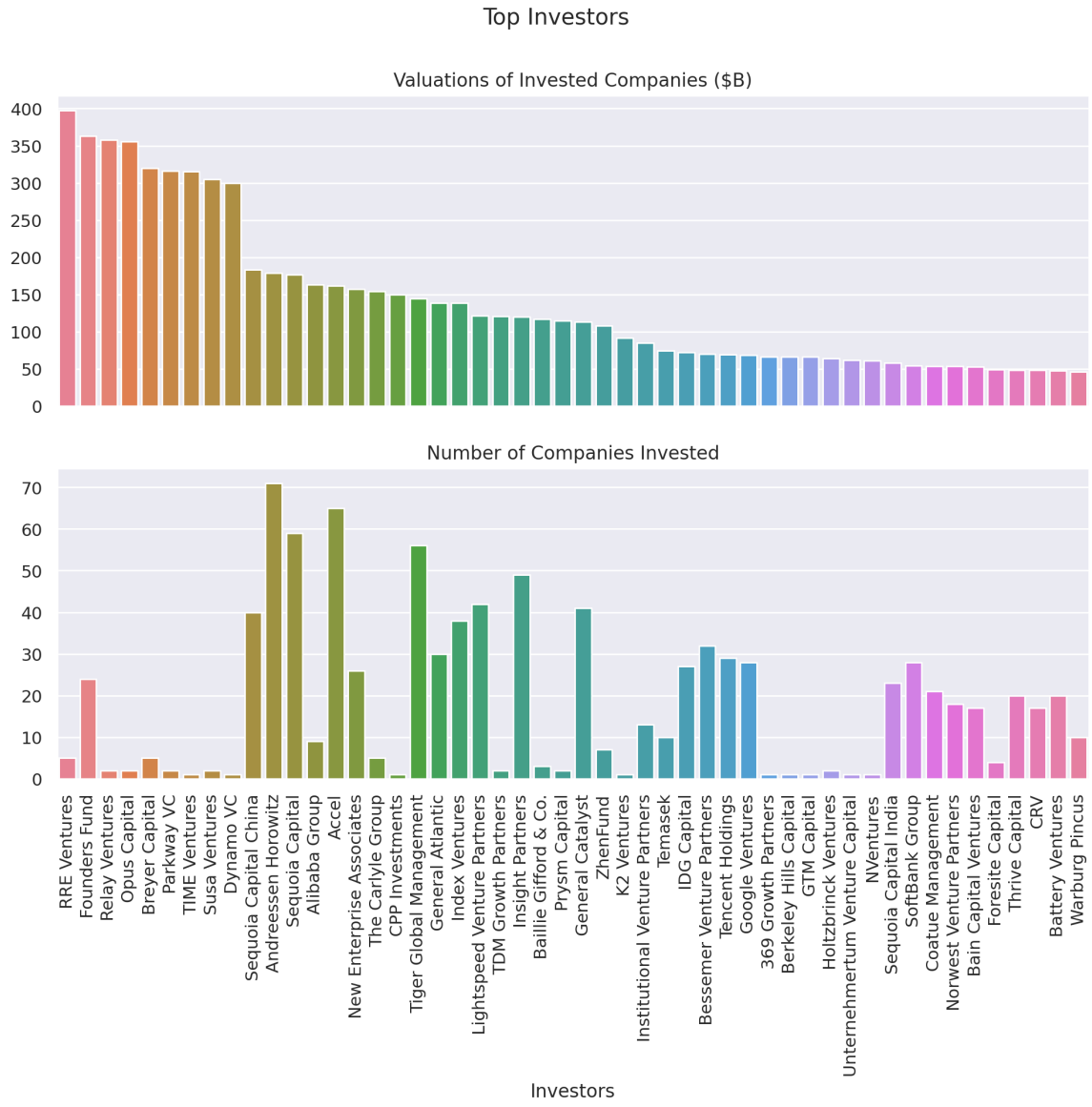
3.5 Investor Analysis

3.5.1 Top Investors

```
def top_investors_agg(grp):
    return pd.Series({'count': grp['Company'].size,
                      'valuation': grp['Latest Valuation ($B)'].sum(),
                      'companies': ', '.join(grp.nlargest(3, 'Latest Valuation
                      ↪  ($B)')['Company'])})
top_investors = df.explode('Investors')\
                  .groupby('Investors')[['Company', 'Latest Valuation ($B)']]\
                  .apply(top_investors_agg)\
                  .sort_values(by=['valuation', 'count'], ascending=False)\
                  .head(50)
top_investors
```

Investors	count	valuation	companies
RRE Ventures	5	397.6	SpaceX, Fanatics, Gopuff
Founders Fund	24	363.01	OpenAI, Scale AI, Articulate
Relay Ventures	2	358	SpaceX, Flexport
Opus Capital	2	355.68	SpaceX, RELEX
Breyer Capital	5	320.16	ByteDance, Promasidor Holdings, Generate B
Parkway VC	2	316	ByteDance, EcoVadis
TIME Ventures	1	315	ByteDance
Susa Ventures	2	304.9	OpenAI, Meesho
Dynamo VC	1	300	OpenAI
Sequoia Capital China	40	183.61	Stripe, Miro, Airwallex
Andreessen Horowitz	71	179.01	Bitmain Technologies, Digital Currency Group
Sequoia Capital	59	176.7	Faire, Bitmain Technologies, Airtable
Alibaba Group	9	163.39	Ant Group, Starburst, Redis
Accel	65	161.91	DJI Innovations, Checkout.com, Dapper Labs
New Enterprise Associates	26	157.5	Anthropic, DJI Innovations, Celonis
The Carlyle Group	5	154.55	Ant Group, Paradox, InCred
CPP Investments	1	150	Ant Group
Tiger Global Management	56	144.47	Devoted Health, Ripple, OYO Rooms
General Atlantic	30	138.95	Databricks, Chime, Ro
Index Ventures	38	138.65	Canva, Scale AI, Airtable
Lightspeed Venture Partners	42	121.19	Nature’s Fynd, Xiaohongshu, ServiceTitan
TDM Growth Partners	2	121	xAI, FalconX
Insight Partners	49	120.07	OpenSea, Airtable, Gusto
Baillie Gifford & Co.	3	117.4	xAI, Carbon, Clip
Prysm Capital	2	115.1	xAI, GoCardless
General Catalyst	41	113.46	Safe Superintelligence, Dapper Labs, Back Ma
ZhenFund	7	108.2	Stripe, Dream11, Physical Intelligence
K2 Ventures	1	91.5	Stripe
Institutional Venture Partners	13	85.24	Anthropic, ClickUp, Flock Safety
Temasek	10	74.58	Canva, Xingsheng Selected, Huolala
IDG Capital	27	72.08	Talkdesk, SumUp, Airwallex
Bessemer Venture Partners	32	70.31	OpenSea, ServiceTitan, Dataiku
Tencent Holdings	29	69.03	OYO Rooms, Bolt, Gemini
Google Ventures	28	68.81	Faire, Attentive, OakNorth Bank
369 Growth Partners	1	66	SHEIN
Berkeley Hills Capital	1	66	SHEIN
GTM Capital	1	66	SHEIN
Holtzbrinck Ventures	2	64	Databricks, Mysten Labs
Unternehmertum Venture Capital	1	62	Databricks
NVentures	1	61.5	Anthropic
Sequoia Capital India	23	57.97	Plaid, ContentSquare, Collibra
SoftBank Group	28	54.18	Trade Republic, Hopper, Impossible Foods
Coatue Management	21	53.79	Discord, Airwallex, Arctic Wolf Networks
Norwest Venture Partners	18	53.43	Anduril, Ripple, Houzz
Bain Capital Ventures	17	26 52.66	Kavak, Toss, Ziroom
Foresite Capital	4	49.2	CoreWeave, CoreWeave, Front
Thrive Capital	20	48.81	Netskope, Wiz, Checkr
GPV	17	48.18	Netskope, Gemini, Helsing

```
fig, ax = plt.subplots(2, 1, figsize=(12, 8), sharex=True)

sns.barplot(top_investors, ax=ax[0], y='valuation', x=top_investors.index,
↪  hue=top_investors.index, legend=False)
ax[0].set(ylabel=None, title='Valuations of Invested Companies ($B)')

sns.barplot(top_investors, ax=ax[1], y='count', x=top_investors.index,
↪  hue=top_investors.index, legend=False)
ax[1].set(ylabel=None, title='Number of Companies Invested')

plt.xticks(rotation=90)
plt.suptitle('Top Investors')
plt.show()
```



3.6 Founder Analysis

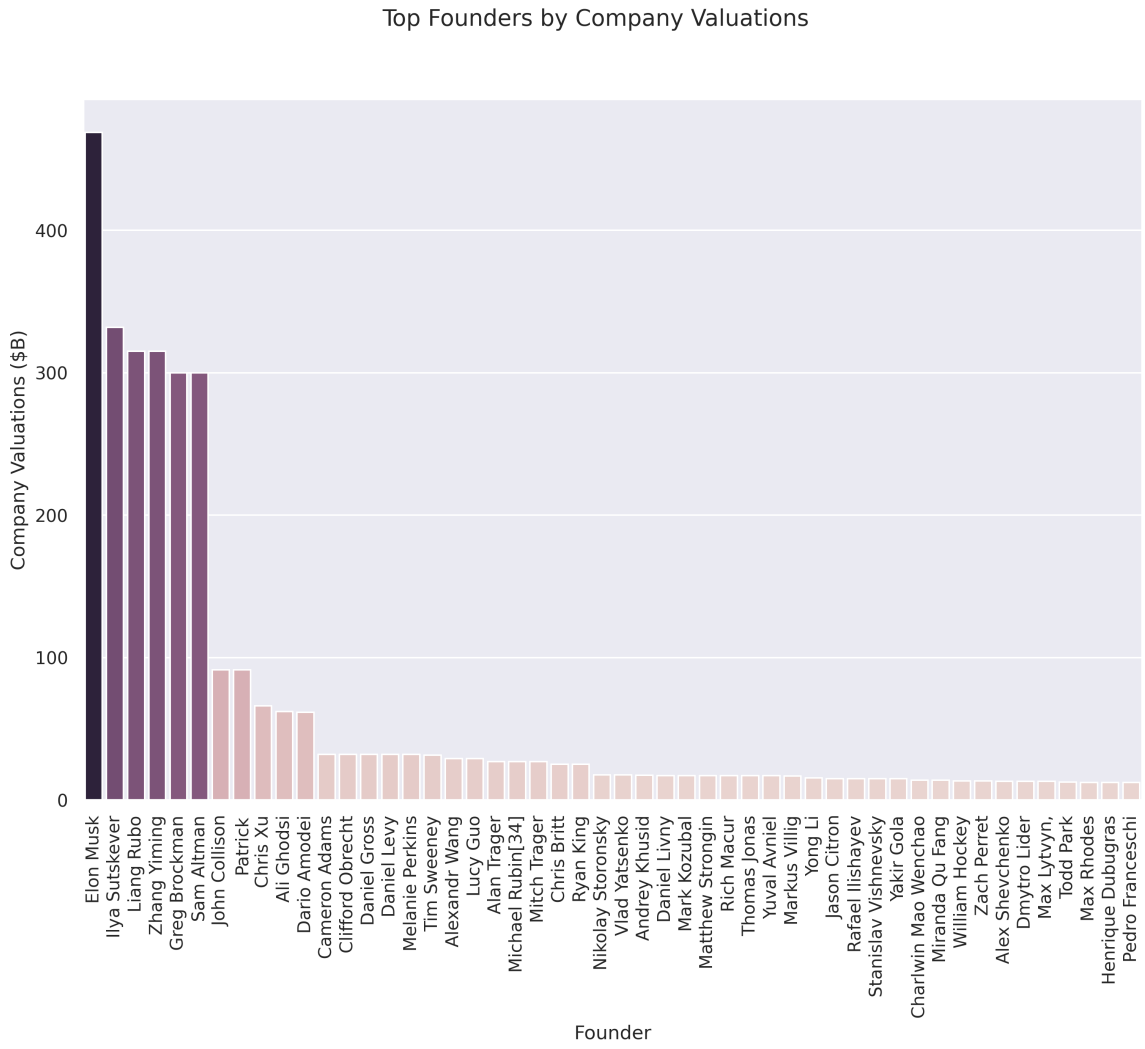
3.6.1 Top Founders

```
top_founders = df.explode('Founder(s)')\
                 .groupby('Founder(s)')[['Latest Valuation ($B)', 'Company']]\
                 .agg(count=('Company', 'count'), companies=('Company', lambda x: ',
                 ↪  '.join(x)), valuation=('Latest Valuation ($B)', 'sum'))\
                 .sort_values(by=['valuation', 'count'], ascending=False)\
                 .head(50)
print(top_founders)
```

Founder(s)	count	companies	valuation
Elon Musk	3	SpaceX, xAI, The Boring Company	468.70
Ilya Sutskever	2	OpenAI, Safe Superintelligence	332.00
Liang Rubo	1	ByteDance	315.00
Zhang Yiming	1	ByteDance	315.00
Greg Brockman	1	OpenAI	300.00
Sam Altman	1	OpenAI	300.00
John Collison	1	Stripe	91.50
Patrick	1	Stripe	91.50
Chris Xu	1	SHEIN	66.00
Ali Ghodsi	1	Databricks	62.00
Dario Amodei	1	Anthropic	61.50
Cameron Adams	1	Canva	32.00
Clifford Obrecht	1	Canva	32.00
Daniel Gross	1	Safe Superintelligence	32.00
Daniel Levy	1	Safe Superintelligence	32.00
Melanie Perkins	1	Canva	32.00
Tim Sweeney	1	Epic Games	31.50
Alexandr Wang	1	Scale AI	29.00
Lucy Guo	1	Scale AI	29.00
Alan Trager	1	Fanatics	27.00
Michael Rubin[34]	1	Fanatics	27.00
Mitch Trager	1	Fanatics	27.00
Chris Britt	1	Chime	25.00
Ryan King	1	Chime	25.00
Nikolay Storonsky	1	Revolut	17.75
Vlad Yatsenko	1	Revolut	17.75
Andrey Khusid	1	Miro	17.50
Daniel Livny	1	Nature's Fynd	17.00
Mark Kozubal	1	Nature's Fynd	17.00
Matthew Strongin	1	Nature's Fynd	17.00
Rich Macur	1	Nature's Fynd	17.00

Thomas Jonas	1	Nature's Fynd	17.00
Yuval Avniel	1	Nature's Fynd	17.00
Markus Villig	2	Bolt, Bolt	16.80
Yong Li	1	Yuanfudao	15.50
Jason Citron	1	Discord	15.00
Rafael Ilishayev	1	Gopuff	15.00
Stanislav Vishnevsky	1	Discord	15.00
Yakir Gola	1	Gopuff	15.00
Charlwin Mao Wenchao	1	Xiaohongshu	14.00
Miranda Qu Fang	1	Xiaohongshu	14.00
William Hockey	1	Plaid	13.40
Zach Perret	1	Plaid	13.40
Alex Shevchenko	1	Grammarly	13.00
Dmytro Lider	1	Grammarly	13.00
Max Lytvyn,	1	Grammarly	13.00
Todd Park	1	Devoted Health	12.60
Max Rhodes	1	Faire	12.40
Henrique Dubugras	1	Brex	12.30
Pedro Franceschi	1	Brex	12.30

```
fig, ax = plt.subplots(figsize=(12, 8), dpi=300, sharex=True)

ax = sns.barplot(top_founders, y='valuation', x=top_founders.index, hue='valuation',
↪  legend=False)
ax.set(ylabel='Company Valuations ($B)', xlabel='Founder')

plt.xticks(rotation=90)
plt.suptitle('Top Founders by Company Valuations')
plt.show()
```



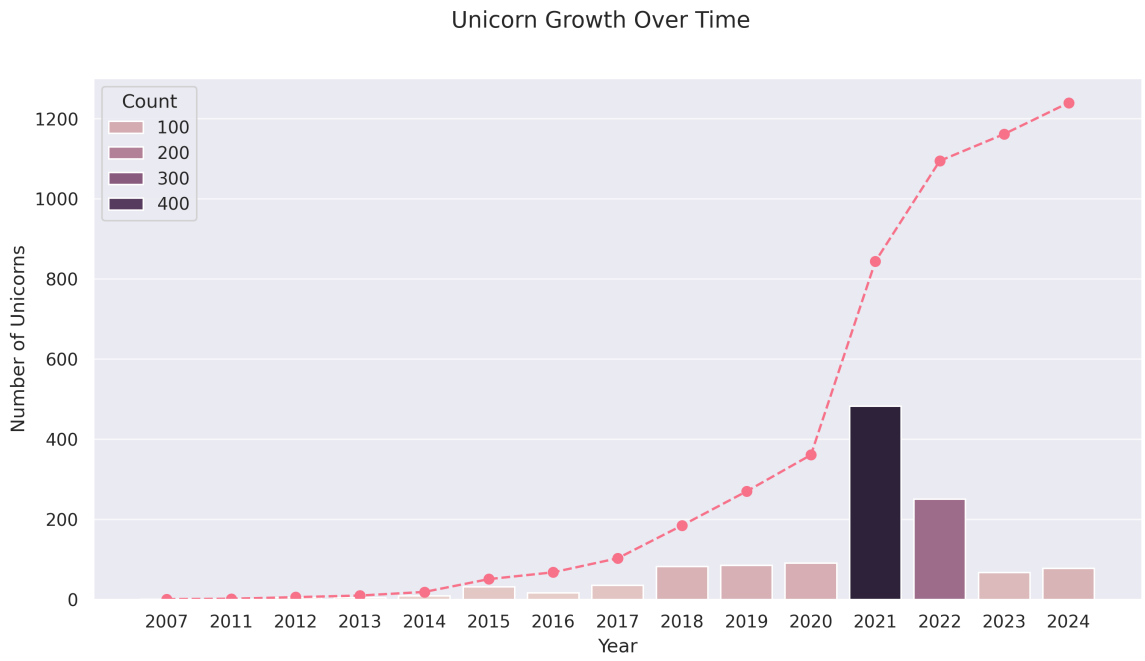
4 Time-Based Analysis

4.1 Unicorn Growth Over Time

```
_df = df.groupby('Unicorn Year').size().reset_index(name='Count')
_df['Accumulated Count'] = _df['Count'].cumsum()
_df
```

```
plt.subplots(figsize=(12, 6), dpi=300)
sns.barplot(_df, x='Unicorn Year', y='Count', hue='Count')
plt.plot(_df['Accumulated Count'], marker='o', linestyle='dashed')
plt.suptitle('Unicorn Growth Over Time')
plt.xlabel('Year')
plt.ylabel('Number of Unicorns')
plt.grid(axis='y', alpha=0.7)
plt.show()
```

	Unicorn Year	Count	Accumulated Count
0	2007	1	1
1	2011	1	2
2	2012	4	6
3	2013	4	10
4	2014	9	19
5	2015	32	51
6	2016	17	68
7	2017	35	103
8	2018	82	185
9	2019	85	270
10	2020	91	361
11	2021	483	844
12	2022	251	1095
13	2023	67	1162
14	2024	78	1240

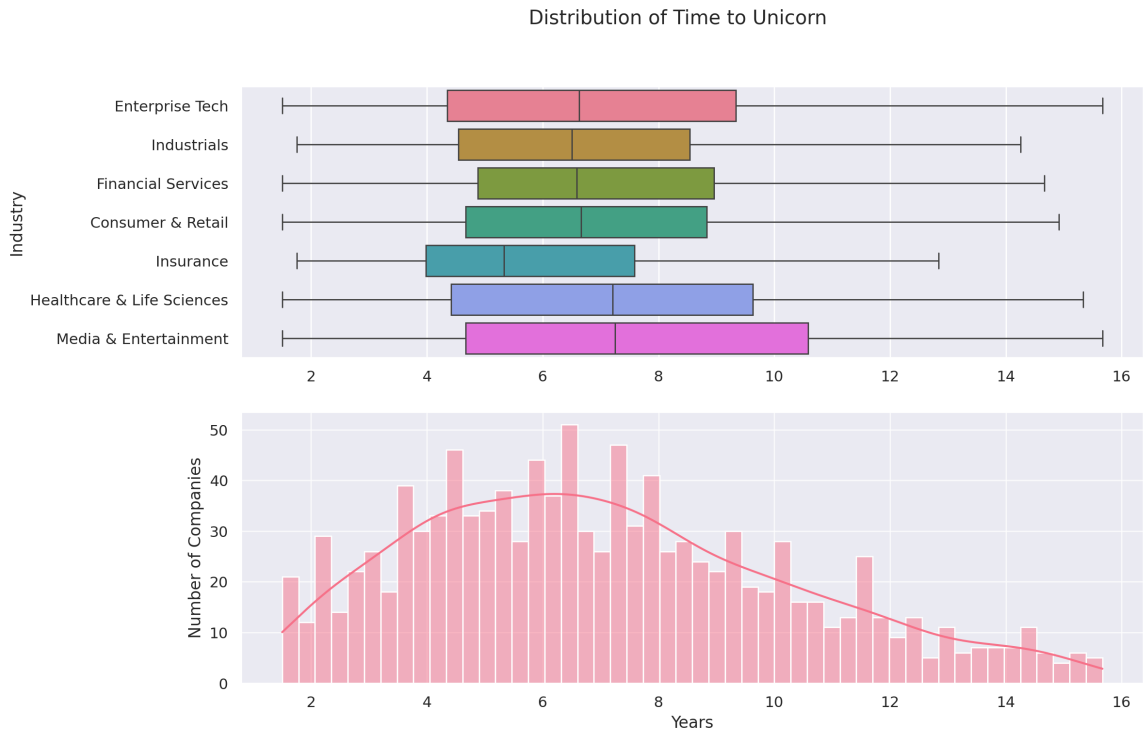


The surge of unicorns was reported as "meteoric" for 2021, with $71 billion invested in 340 new companies, a banner year for startups and for the US venture capital industry; the unprecedented number of companies valued at more than $1 billion during 2021 exceeded the sum total of the five previous years.

4.2 Time to Unicorn

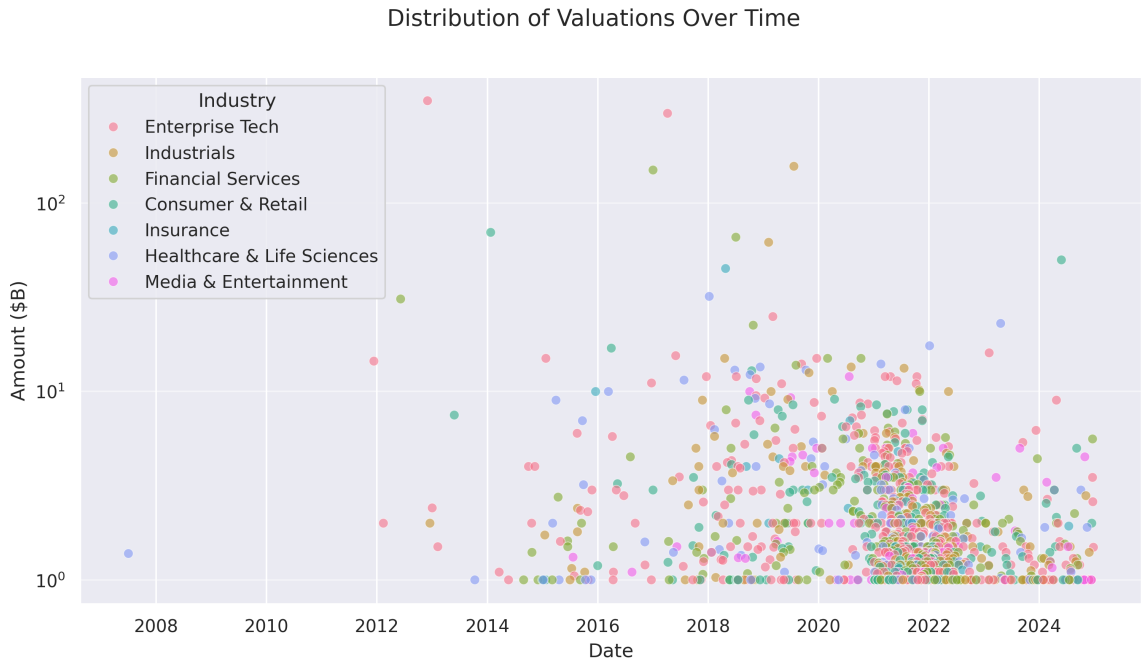
```
# Calculate 5th and 95th percentiles
lower_bound = df['Years to Unicorn'].quantile(0.05)
upper_bound = df['Years to Unicorn'].quantile(0.95)
```

```
# Filter out values outside the 5th and 95th percentiles
df_filtered = df[(df['Years to Unicorn'] >= lower_bound) & (df['Years to Unicorn'] <=
↪  upper_bound)]

fig, ax = plt.subplots(2, 1, figsize=(12, 8))
sns.boxplot(df_filtered, x='Years to Unicorn', y='Industry', hue='Industry', ax=ax[0],
↪  showfliers=False)
ax[0].set(xlabel=None)
sns.histplot(df_filtered['Years to Unicorn'].dropna(), bins=50, ax=ax[1], kde=True)
ax[1].set(xlabel='Years', ylabel='Number of Companies')
plt.suptitle('Distribution of Time to Unicorn')
plt.grid(alpha=0.75)
plt.show()
```



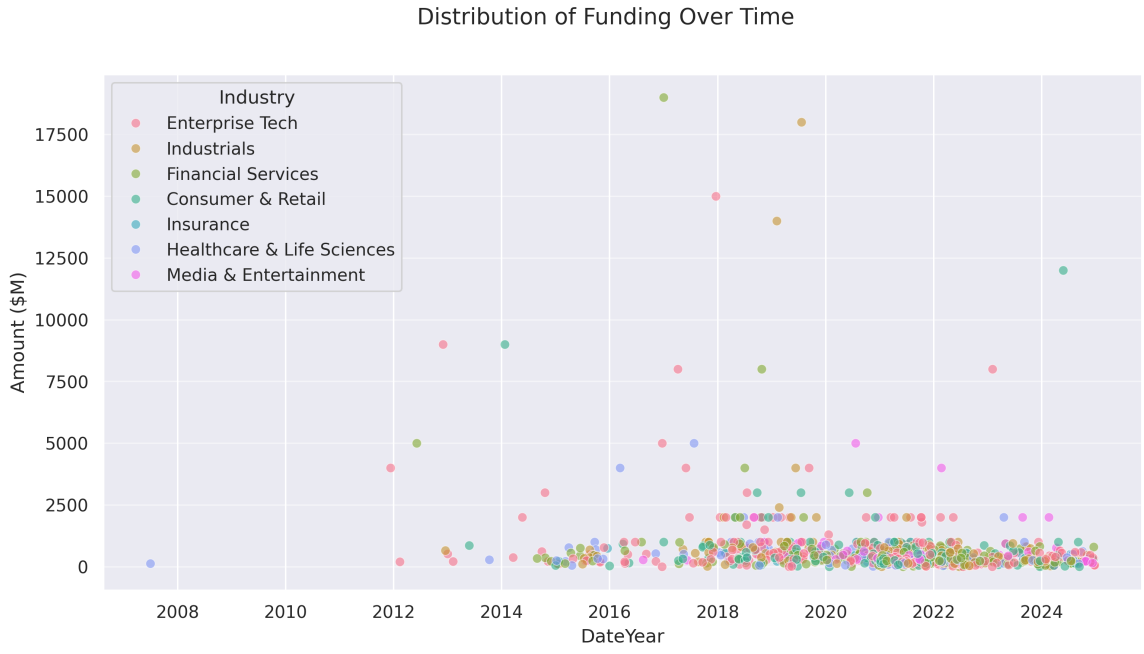
4.3 Distribution of Valuations Over Time

```
plt.subplots(figsize=(12, 6), dpi=300)
sns.scatterplot(df, x='Unicorn Date', y='Valuation ($B)', alpha=.6, hue='Industry')
plt.suptitle('Distribution of Valuations Over Time')
plt.xlabel('Date')
plt.ylabel('Amount ($B)')
# plt.xticks(df['Unicorn Year'].unique(), rotation=45)
plt.grid(axis='y', alpha=0.5)
plt.yscale('log')
plt.show()
```



4.4 Distribution of Funding Over Time

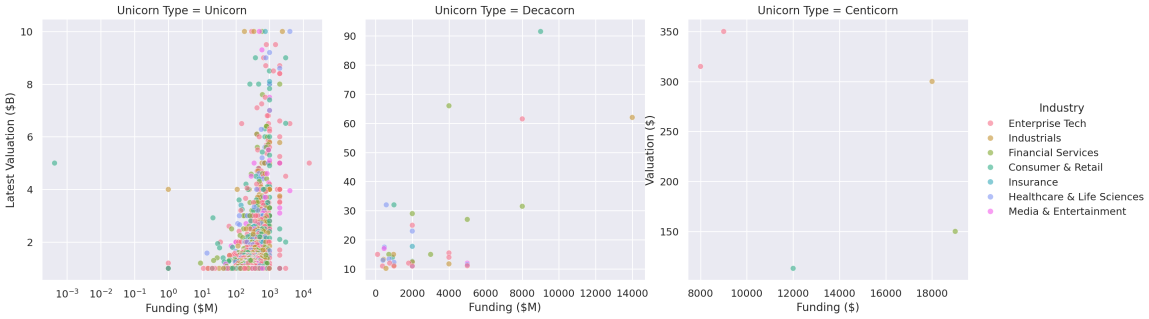
```
plt.subplots(figsize=(12, 6), dpi=300)
sns.scatterplot(df, x='Unicorn Date', y=df['Funding ($M)'], alpha=0.6, hue='Industry')
plt.suptitle('Distribution of Funding Over Time')
plt.xlabel('Date')
plt.ylabel('Amount ($M)')
# plt.xticks(df['Unicorn Year'].unique(), rotation=45)
plt.grid(axis='y', alpha=0.5)
# plt.yscale('log')
plt.show()
```



5 Correlation Analysis

5.1 Relationship between Funding and Valuation

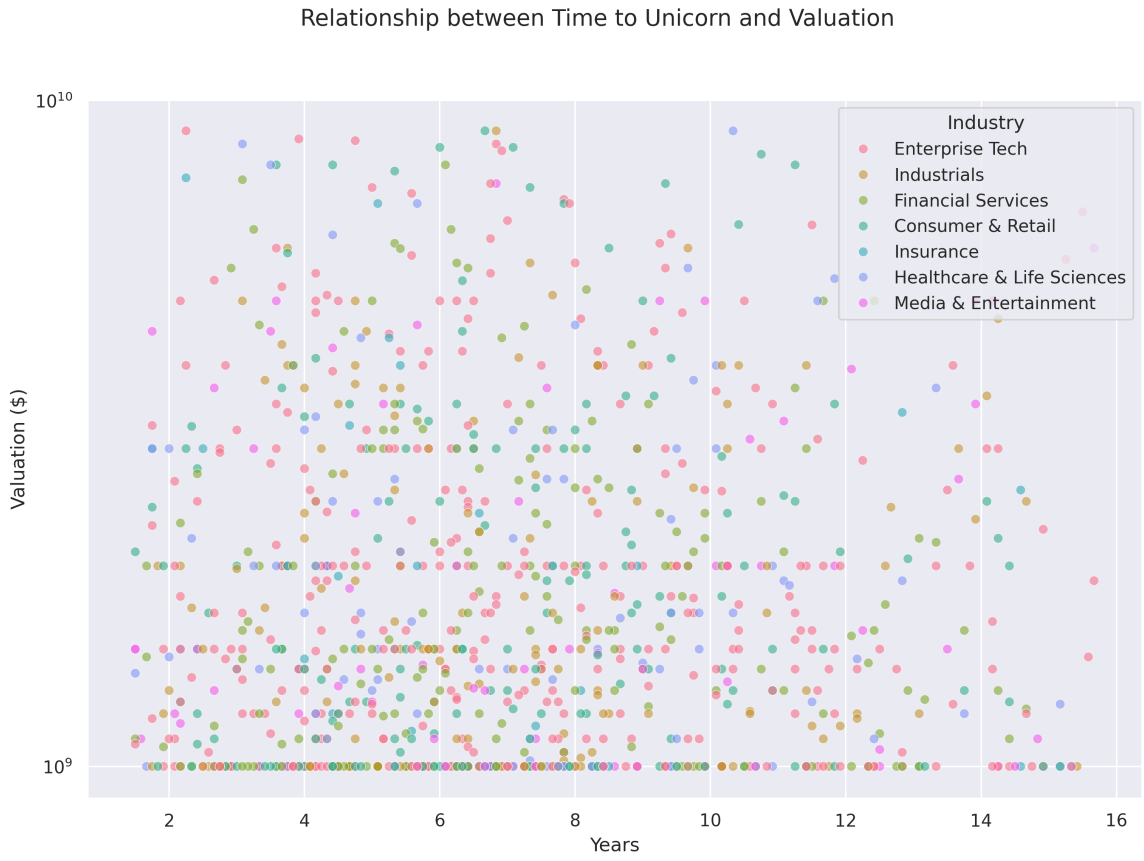
```
df_filtered = df[(df['Total Equity Funding ($)'] >= df['Total Equity Funding
↪  ($)'].quantile(0.05)) &
                 (df['Total Equity Funding ($)'] <= df['Total Equity Funding
                 ↪  ($)'].quantile(0.95)) &
                 (df['Valuation ($)'] >= df['Valuation ($)'].quantile(0.05)) &
                 (df['Valuation ($)'] <= df['Valuation ($)'].quantile(0.95))]

# plt.subplots(figsize=(12, 8), dpi=300)
# sns.relplot(df, x='Total Equity Funding ($)', y='Valuation ($)', alpha=0.6,
↪  hue='Industry', row='Unicorn Type')
# print(df[df['Unicorn Type']=='Centicorn'][['Valuation ($B)', 'Funding ($B)']].corr())
g = sns.relplot(df, x='Funding ($M)', y='Latest Valuation ($B)',
                alpha=0.6, hue='Industry', col='Unicorn Type',
                facet_kws={'sharey':False, 'sharex':False})
g.axes[0,0].set(xscale='log')
# sns.jointplot(df_filtered, x='Total Equity Funding ($)', y='Valuation ($)', kind='reg',
↪  truncate=False, height=7)
# plt.suptitle('Relationship between Funding and Valuation')
plt.xlabel('Funding ($)')
plt.ylabel('Valuation ($)')
plt.grid(True)
# plt.xscale('log')
# plt.yscale('log')
plt.show()
```



5.2 Relationship between Time to Unicorn and Valuation

```
# Filter out values outside the 5th and 95th percentiles
df_filtered = df[(df['Years to Unicorn'] >= df['Years to Unicorn'].quantile(0.05)) &
                 (df['Years to Unicorn'] <= df['Years to Unicorn'].quantile(0.95)) &
                 (df['Valuation ($)'] >= df['Valuation ($)'].quantile(0.05)) &
                 (df['Valuation ($)'] <= df['Valuation ($)'].quantile(0.95))]

plt.subplots(figsize=(12, 8), dpi=300)
sns.scatterplot(df, x=df_filtered['Years to Unicorn'], y=df['Valuation ($)'], alpha=0.6,
↪  hue='Industry')
```

```
plt.suptitle('Relationship between Time to Unicorn and Valuation')
plt.xlabel('Years')
plt.ylabel('Valuation ($)')
plt.grid(True)
plt.yscale('log')
plt.show()
```



6 Historical Analysis

6.1 Survival and Acquisition

- Find out companies no longer listed as unicorns in 2024

```
df_2022 = pd.read_csv('input/datasets/Unicorn_Companies (March 2022).csv')
df_2022['Valuation ($B)'] = pd.to_numeric(df_2022['Valuation ($B)'].str.replace('$',
↪  ''))
df_exit = df_2022[~df_2022['Company'].str.lower().isin(df['Company'].str.lower())]
```

```
178 companies no longer listed in 2024 unicorn list
```

```
print(df_exit.head())
```

	Company	Valuation ($B)	Date Joined	Country	Cit
7	Instacart	39.00	12/30/2014	United States	San Francisc
10	FTX	32.00	7/20/2021	Bahamas	Fintec
15	J&T Express	20.00	4/7/2021	Indonesia	Jakart
31	Biosplice Therapeutics	12.00	8/6/2018	United States	San Dieg
39	Weilong	10.88	5/8/2021	China	Luoh

	Total Raised	Financial Stage	Investors Count	Deal Terms	Portfolio Exits
7	$2.686B	NaN	29.0	12.0	NaN
10	$1.829B	Acq	40.0	3.0	1.0
15	$4.653B	NaN	9.0	3.0	NaN
31	$561.5M	NaN	10.0	1.0	NaN
39	$559.74M	NaN	7.0	1.0	NaN

- Financial Stage

```
df_2022['Financial Stage'].value_counts()
```

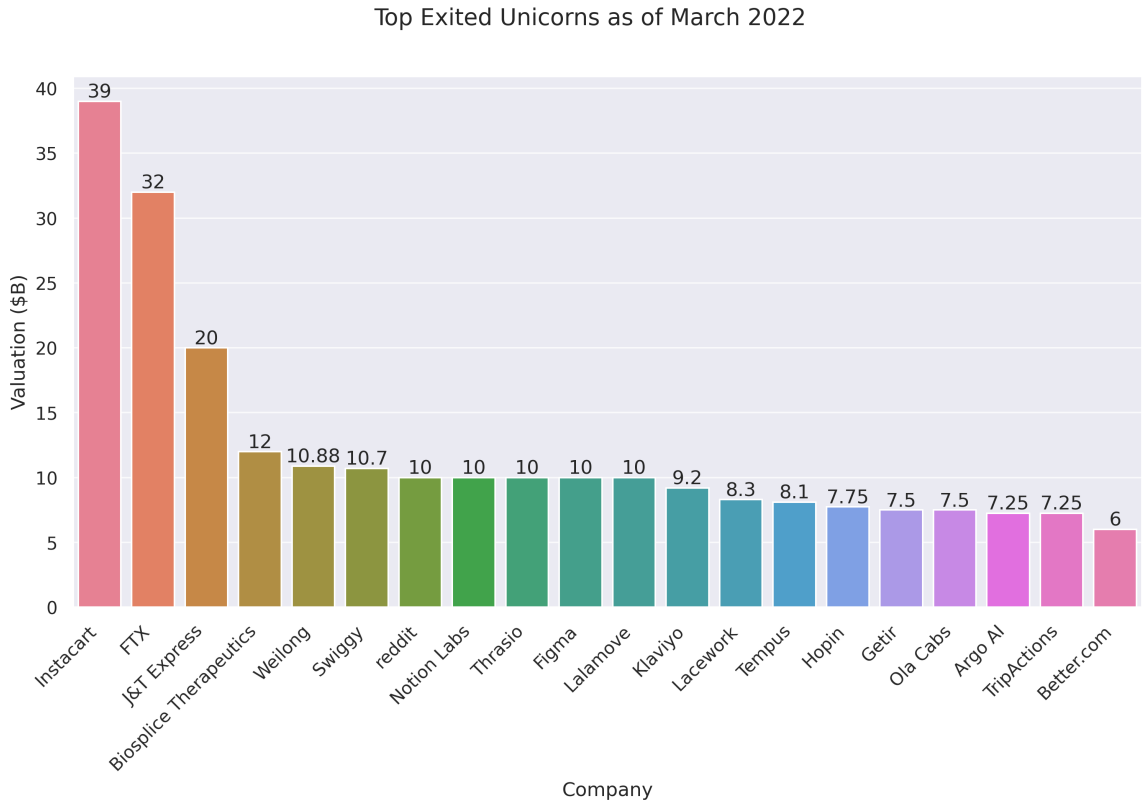
```
Financial Stage
Acquired       22
Divestiture     8
IPO             7
Acq             7
Asset           1
Take            1
Management      1
Reverse         1
Corporate       1
Name: count, dtype: int64
```

6.1.1 Top Exited Unicorns as of March 2022

```
df_exit_top_companies = df_exit.sort_values('Valuation ($B)', ascending=False).head(20)
# print(df_exit_top_companies)
```

```
plt.subplots(figsize=(12, 6), dpi=300)
ax = sns.barplot(df_exit_top_companies,
                 x='Company',
                 y='Valuation ($B)',
                 hue='Company')
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Top Exited Unicorns as of March 2022')
```

```
plt.ylabel('Valuation ($B)')
plt.xlabel('Company')
plt.xticks(rotation=45, ha='right')
plt.grid(axis='y', alpha=0.75)
plt.show()
```

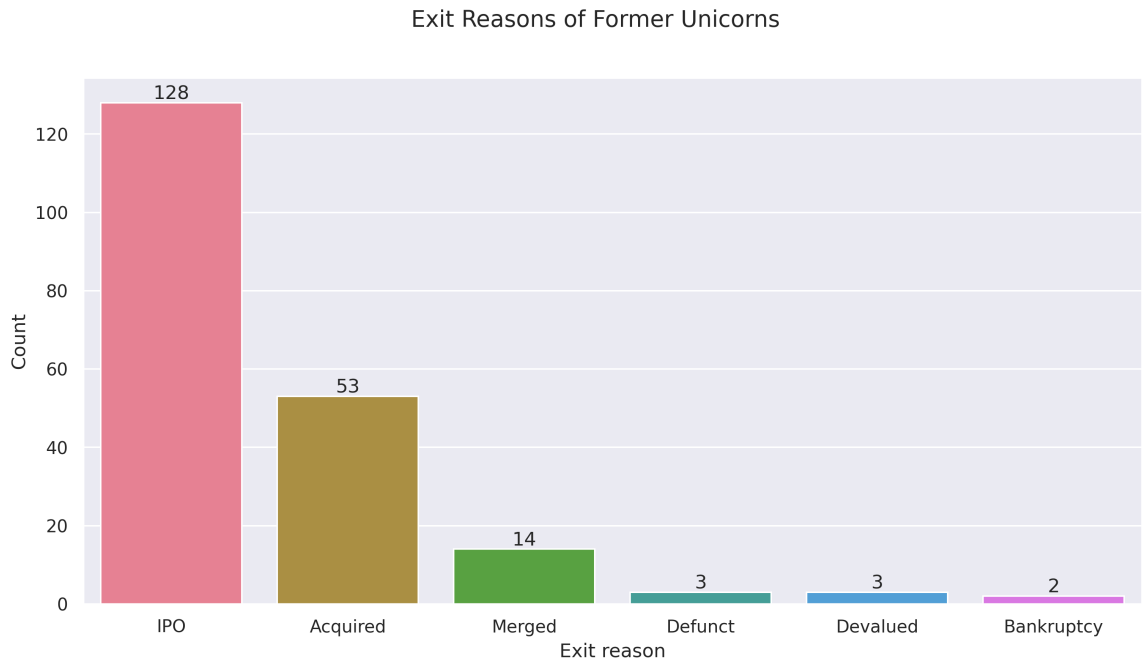


6.1.2 Exit Reasons of Former Unicorns

```
_df = pd.read_csv('input/raw_data/list-of-unicorn-former-startups_20250619
↪  (wikipedia).csv')
_df['Company'] = _df['Company'].str.strip()
def correct_exit_reasons(s):
    s = re.sub(r'\[.*\]', '', s)
    s= s.strip()
    if 'merge' in s.lower():
        return 'Merged'
    if 'acquire' in s.lower() or 'acquisition' in s.lower() or 'takeover' in s.lower():
        return 'Acquired'
    if 'devaluation' == s.lower():
        return 'Devalued'
    if 'direct listing' == s.lower():
        return 'IPO'
    return s
_df['Exit reason'] = _df['Exit reason'].dropna().apply(correct_exit_reasons)
# _df = _df[_df['Company'].str.lower().isin(df_exit['Company'].str.lower())]
_df['Exit reason'].value_counts()
```

```
Exit reason
IPO           128
Acquired       53
Merged         14
Defunct         3
Devalued        3
Bankruptcy      2
Name: count, dtype: int64
```

```
exit_reasons = _df['Exit reason'].value_counts().reset_index(name='Count')
# print(exit_reasons.index)
plt.subplots(figsize=(12, 6), dpi=300)
ax = sns.barplot(exit_reasons, x='Exit reason', y='Count', hue='Exit reason')
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Exit Reasons of Former Unicorns')
plt.show()
```



7 Funded by Y-Combinator

Y Combinator, founded in 2005 by Paul Graham and others, is a prestigious startup accelerator based in Silicon Valley that provides early-stage companies with seed funding, mentorship, and resources over a three-month program held twice a year. Startups receive initial funding in exchange for equity and culminate in a Demo Day where they pitch to investors. Y Combinator has launched successful companies like Airbnb, Dropbox, and Stripe, significantly impacting the startup ecosystem and inspiring numerous other accelerators globally.

- **Datasets**
  - **YC Campanies**

```
df_yc_companies = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/companies.csv')

df_yc_industries = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/industries.csv')
df_yc_tags = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/tags.csv')
# print(df_yc_tags.groupby('id')['tag'].agg(list).reset_index())
df_yc_companies = df_yc_companies.merge(df_yc_industries[['id',
↪  'industry']].groupby('id')['industry'].agg(list).reset_index(), on='id',
↪  how='left')
df_yc_companies =
↪  df_yc_companies.merge(df_yc_tags.groupby('id')['tag'].agg(list).reset_index(),
↪  on='id', how='left')
df_yc_companies = df_yc_companies[['name', 'slug', 'oneLiner', 'website',
↪  'smallLogoUrl', 'teamSize', 'tag', 'industry', 'batch']].rename(columns={
    'name': 'Company',
    'slug': 'Slug',
    'oneLiner': 'Short Description',
    'website': 'Website',
    'smallLogoUrl': 'Logo',
    'teamSize': 'Team Size',
    'tag': 'Tags',
    'industry': 'Industries',
    'batch': 'Batch'
})
print(df_yc_companies.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4844 entries, 0 to 4843
Data columns (total 9 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   Company            4844 non-null   object
 1   Slug               4841 non-null   object
 2   Short Description  4692 non-null   object
 3   Website            4817 non-null   object
 4   Logo               4197 non-null   object
 5   Team Size          4766 non-null   float64
 6   Tags               4463 non-null   object
 7   Industries         4825 non-null   object
 8   Batch              4844 non-null   object
dtypes: float64(1), object(8)
memory usage: 340.7+ KB
None
```

```
df2_yc_companies = pd.read_json('input/datasets/yc_startups.json')
print(df2_yc_companies.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   name         1000 non-null   object
 1   description  1000 non-null   object
 2   location     1000 non-null   object
 3   url          1000 non-null   object
 4   tags         1000 non-null   object
 5   site_url     999 non-null    object
 6   tag_line     999 non-null    object
 7   long_desc    999 non-null    object
 8   thumbnail    975 non-null    object
 9   founders     999 non-null    object
 10  meta         999 non-null    object
 11  socials      999 non-null    object
dtypes: object(12)
memory usage: 93.9+ KB
None
```

- **YC Founders**

```
df_yc_founders = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/founders.csv')
print(df_yc_founders.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8465 entries, 0 to 8464
Data columns (total 8 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   first_name       8461 non-null   object
 1   last_name        8456 non-null   object
 2   hnid             8465 non-null   object
 3   avatar_thumb     8465 non-null   object
 4   current_company  7624 non-null   object
 5   current_title    2201 non-null   object
 6   company_slug     8465 non-null   object
 7   top_company      8465 non-null   bool
dtypes: bool(1), object(7)
```

```
memory usage: 471.3+ KB
None
```

7.1 How many YC companies are in unicorn status currently?

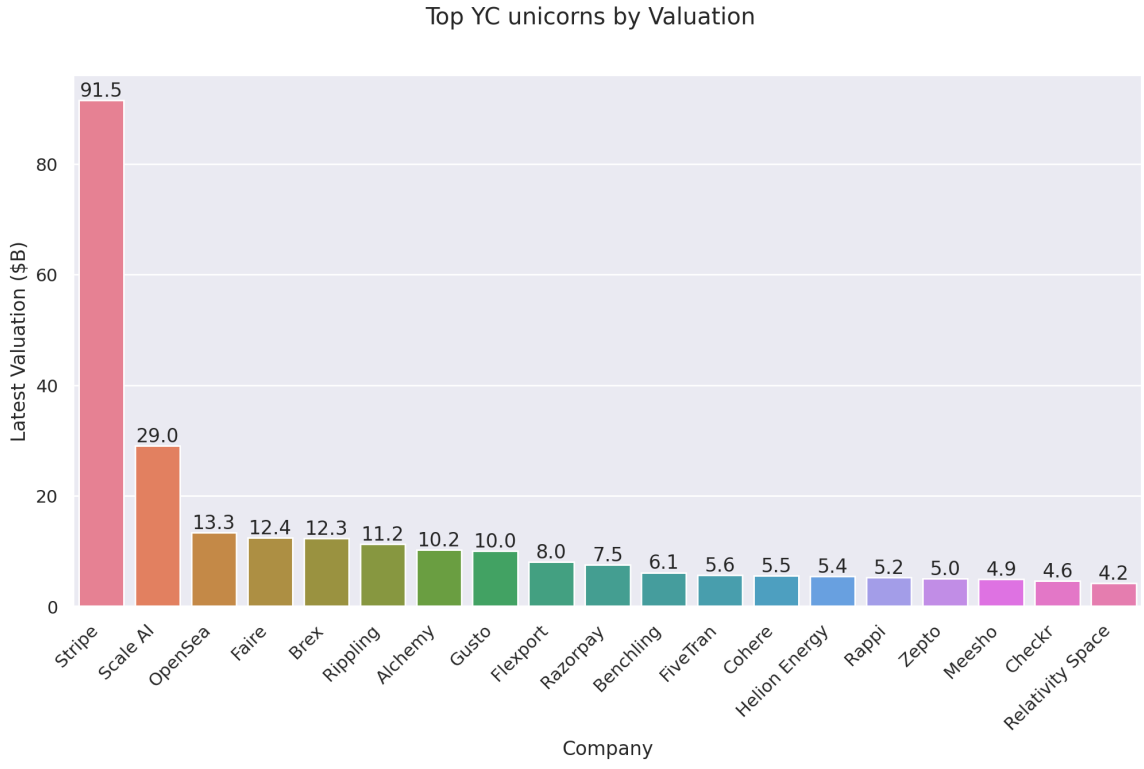
```
df_yc_unicorns = df.assign(tmp_col=df.Company.str.lower()).merge(
    df_yc_companies[['Company', 'Slug', 'Short Description', 'Website', 'Logo', 'Team
    ↪  Size', 'Tags', 'Industries', 'Batch']].assign(tmp_col=lambda x:
    ↪  x.Company.str.lower()),
    on='tmp_col', how='inner').drop(['tmp_col', 'Company_y'],
    ↪  axis=1).rename(columns={'Company_x': 'Company'})
df_yc_unicorns['Batch Season'] = df_yc_unicorns['Batch'].apply(lambda x: 'Summer' if
↪  x[0]=='S' else 'Winter')
df_yc_unicorns['Batch Year'] = pd.to_numeric(df_yc_unicorns['Batch'].apply(lambda x:
↪  f'20{x[1:]}'))
print(df_yc_unicorns.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 98 entries, 0 to 97
Data columns (total 29 columns):
 #   Column                          Non-Null Count  Dtype
---  ------                          --------------  -----
 0   Company                         98 non-null     object
 1   Valuation ($B)                  98 non-null     float64
 2   Total Equity Funding ($)        98 non-null     int64
 3   Unicorn Date                    98 non-null     datetime64[ns]
 4   Date Founded                    98 non-null     int64
 5   Years to Unicorn                98 non-null     object
 6   Industry                        98 non-null     object
 7   Country                         98 non-null     object
 8   City                            98 non-null     object
 9   Select Investors                98 non-null     object
 10  Valuation ($)                   98 non-null     float64
 11  Unicorn Year                    98 non-null     int32
 12  Funding ($B)                    98 non-null     float64
 13  Funding ($M)                    98 non-null     float64
 14  Investors                       98 non-null     object
 15  Years to Unicorn (Months)       98 non-null     int64
 16  Years to Unicorn (Converted)    98 non-null     float64
 17  Latest Valuation ($B)           98 non-null     float64
 18  Founder(s)                      16 non-null     object
 19  Slug                            98 non-null     object
 20  Short Description               97 non-null     object
 21  Website                         98 non-null     object
```

```
 22  Logo                          95 non-null     object
 23  Team Size                     96 non-null     float64
 24  Tags                          92 non-null     object
 25  Industries                    98 non-null     object
 26  Batch                         98 non-null     object
 27  Batch Season                  98 non-null     object
 28  Batch Year                    98 non-null     int64
dtypes: datetime64[ns](1), float64(7), int32(1), int64(4), object(16)
memory usage: 21.9+ KB
None
```

7.2 Top Companies by Valuation

```
df_top_yc_unicorns = df_yc_unicorns.sort_values(by='Latest Valuation ($B)',
↪  ascending=False).head(20)
fig, ax = plt.subplots(figsize=(12,6), dpi=200)
ax = sns.barplot(data=df_top_yc_unicorns, x='Company', y='Latest Valuation ($B)',
↪  hue='Company')
for i in ax.containers:
    ax.bar_label(i, fmt='%.1f')
plt.xticks(rotation=45, ha='right')
plt.suptitle('Top YC unicorns by Valuation')
plt.show()
```

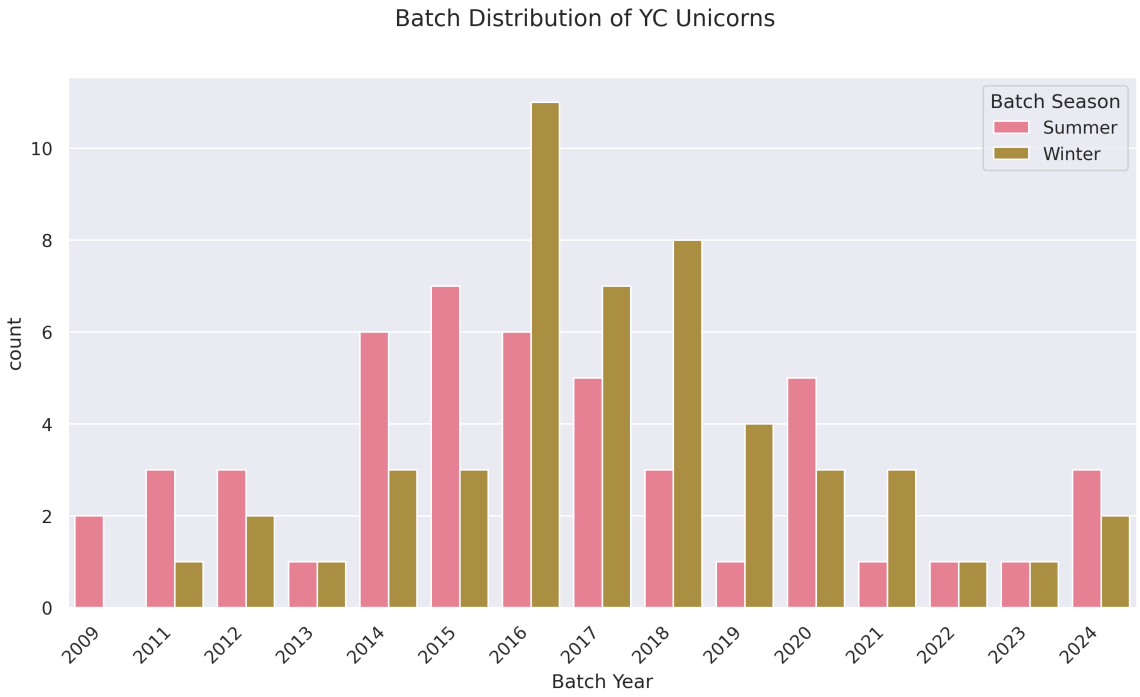


7.3 YC Batch Distribution

```
_df = df_yc_unicorns.groupby(['Batch Year', 'Batch
↪  Season']).size().reset_index(name='count').sort_values(by='Batch Year')
print(_df)
```

	Batch Year	Batch Season	count
0	2009	Summer	2
1	2011	Summer	3
2	2011	Winter	1
3	2012	Summer	3
4	2012	Winter	2
5	2013	Summer	1
6	2013	Winter	1
7	2014	Summer	6
8	2014	Winter	3
9	2015	Summer	7
10	2015	Winter	3
11	2016	Summer	6
12	2016	Winter	11
14	2017	Winter	7
13	2017	Summer	5
15	2018	Summer	3
16	2018	Winter	8
17	2019	Summer	1
18	2019	Winter	4
19	2020	Summer	5
20	2020	Winter	3
21	2021	Summer	1
22	2021	Winter	3
23	2022	Summer	1
24	2022	Winter	1
25	2023	Summer	1
26	2023	Winter	1
27	2024	Summer	3
28	2024	Winter	2

```
plt.subplots(figsize=(12,6),dpi=300)
sns.barplot(_df, x='Batch Year', y='count', hue='Batch Season')
plt.xticks(rotation=45, ha='right')
plt.suptitle('Batch Distribution of YC Unicorns')
plt.show()
```



7.4 Top Countires

```
top_countries = df_yc_unicorns['Country'].value_counts().nlargest(20).index
top_countries
```

```
Index(['United States', 'India', 'United Kingdom', 'Canada', 'Mexico', 'Indonesia', 'Co
```

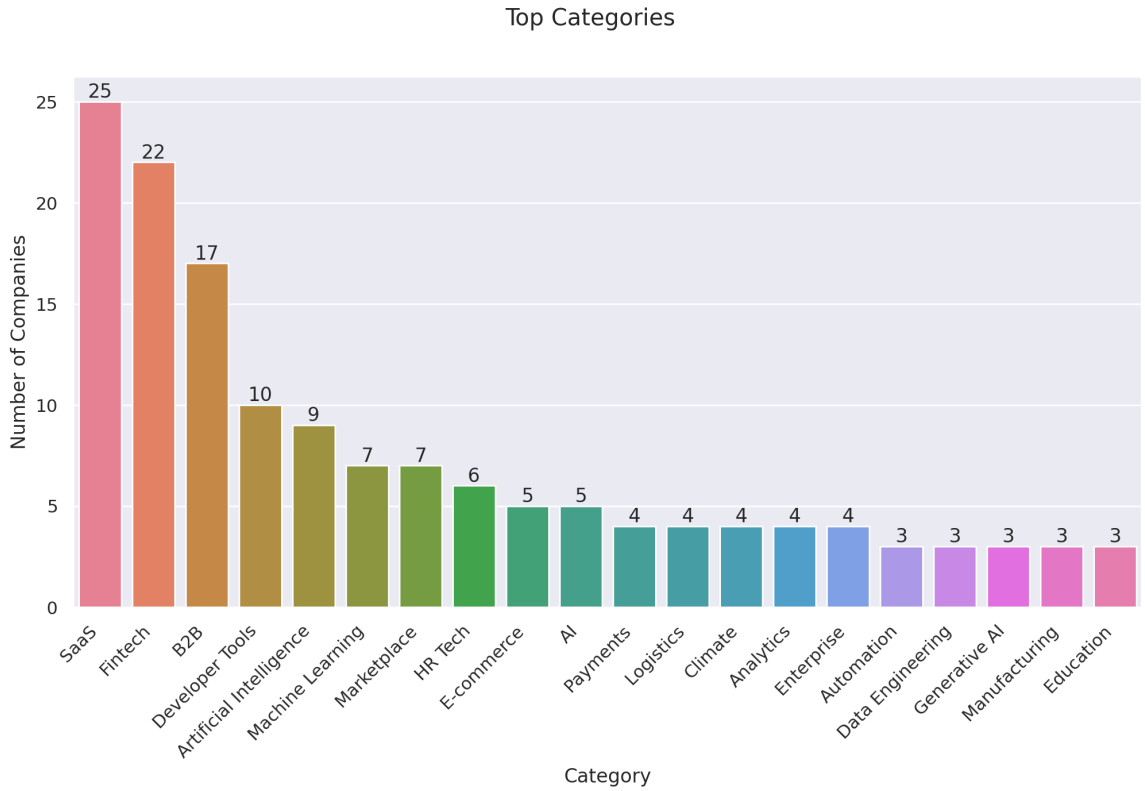
7.5 Top Categories

```
top_categories =
↪  df_yc_unicorns['Tags'].explode().value_counts().head(20).reset_index(name='Count')
print(top_categories)
```

```
                     Tags  Count
0                    SaaS     25
1                 Fintech     22
2                     B2B     17
3          Developer Tools     10
4   Artificial Intelligence      9
5          Machine Learning      7
6               Marketplace      7
7                   HR Tech      6
8                E-commerce      5
9                        AI      5
```

```
10                 Payments      4
11                Logistics      4
12                  Climate      4
13                Analytics      4
14               Enterprise      4
15               Automation      3
16         Data Engineering      3
17            Generative AI      3
18            Manufacturing      3
19                Education      3
```

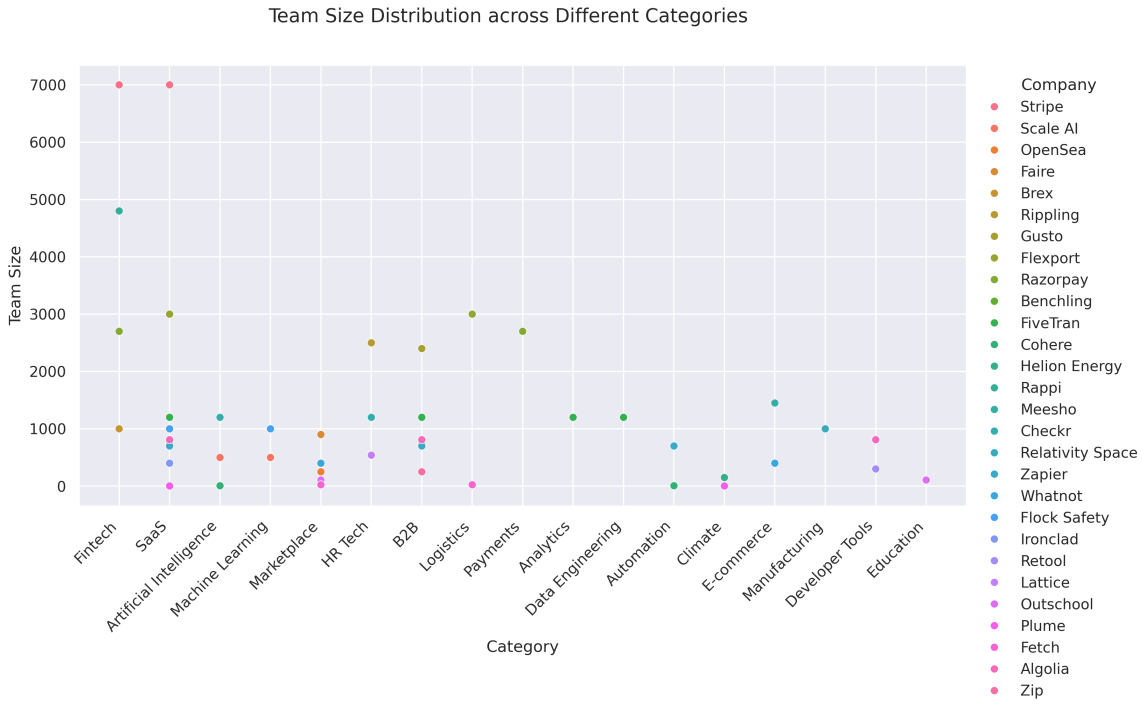
```
plt.subplots(figsize=(12,6), dpi=200)
ax = sns.barplot(data=top_categories, x='Tags', y='Count', hue='Tags')
ax.set(ylabel='Number of Companies',
       xlabel='Category')
for i in ax.containers:
    ax.bar_label(i)
plt.xticks(rotation=45, ha='right')
plt.suptitle('Top Categories')
plt.show()
```



7.5.1 Team Size Distribution across Different Categories

```
_df = df_yc_unicorns.explode('Tags')
_df = _df[_df['Tags'].isin(top_categories['Tags'])]
```

```
_df = _df.sort_values(by='Latest Valuation ($B)', ascending=False).head(50)

plt.subplots(figsize=(12,6), dpi=300)
ax = sns.scatterplot(_df, x='Tags', y='Team Size', hue='Company')
sns.move_legend(ax, "upper left", bbox_to_anchor=(1, 1), frameon=False)
ax.set(ylabel='Team Size',
       xlabel='Category')
plt.xticks(rotation=45, ha='right')
plt.suptitle('Team Size Distribution across Different Categories')
plt.show()
```



8 Predictive Analysis

- **Valuation Predictions:** Use regression models to predict future valuations based on funding and industry factors.
- **Time to Unicorn**: Model the factors influencing the time taken to reach unicorn status.

9 Case Study

9.1 Scale AI

Scale AI, Inc. is an American data annotation company based in San Francisco, California. It provides data labeling and model evaluation services to develop applications for artificial intelligence.

9.2 FTX

FTX Trading Ltd., trading as FTX, is a bankrupt company that formerly operated a cryptocurrency exchange and crypto hedge fund.

9.3 Lalamove

Lalamove is a delivery and logistics company which operates primarily in Asia and parts of Latin America. Lalamove services are currently available in Hong Kong, Taipei, Singapore, Kuala Lumpur, Manila, Cebu, Bangkok, Pattaya, Ho Chi Minh City, Hanoi, Jakarta, Dhaka, São Paulo, Rio de Janeiro, and Mexico City.

10 References

- Unicorn (finance) [wikipedia]
- The YC Startup Directory